# NAVAL POSTGRADUATE SCHOOL

## MONTEREY, CALIFORNIA

# THESIS

**AIRMANSHIP ON THE GROUND:
HOW THE AVIATION INDUSTRY CAN
FUNDAMENTALLY CHANGE THE WAY FIRST
RESPONDERS MANAGE COMPLEX EMERGENCIES**

by

Ryan Fields-Spack

March 2015

Thesis Co-Advisors:                          Christopher Bellavita
                                             Paul Jonathan Smith

**Approved for public release; distribution is unlimited**

THIS PAGE INTENTIONALLY LEFT BLANK

| REPORT DOCUMENTATION PAGE | | | *Form Approved OMB No. 0704-0188* |
|---|---|---|---|
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503. | | | |
| **1. AGENCY USE ONLY** *(Leave blank)* | **2. REPORT DATE** March 2015 | **3. REPORT TYPE AND DATES COVERED** Master's Thesis | |
| **4. TITLE AND SUBTITLE** AIRMANSHIP ON THE GROUND: HOW THE AVIATION INDUSTRY CAN FUNDAMENTALLY CHANGE THE WAY FIRST RESPONDERS MANAGE COMPLEX EMERGENCIES | | | **5. FUNDING NUMBERS** |
| **6. AUTHOR(S)** Ryan Fields-Spack | | | |
| **7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)** Naval Postgraduate School Monterey, CA 93943-5000 | | | **8. PERFORMING ORGANIZATION REPORT NUMBER** |
| **9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)** N/A | | | **10. SPONSORING/MONITORING AGENCY REPORT NUMBER** |
| **11. SUPPLEMENTARY NOTES** The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number ____N/A____. | | | |
| **12a. DISTRIBUTION / AVAILABILITY STATEMENT** Approved for public release; distribution is unlimited | | | **12b. DISTRIBUTION CODE** A |

**13. ABSTRACT (maximum 200 words)**

Police and fire departments today are challenged with an increasing frequency of complex emergencies and a continuing cultural divide. Devoted people from both agencies are actively working to improve their response capability. Rather than solving the problem solely in house, other disciplines may be able to help. This thesis investigated what the aviation industry could teach the emergency services field about how to approach complex life-sensitive problems. A structured focused comparison model was used to evaluate aviation's use of Crew Resource Management, the pre-flight briefing, and the concept of airmanship in relation to how they may benefit the response capability of police and fire commanders at a combined emergency response. The research concludes that police and fire departments in the United States would immediately benefit from instituting joint pre-shift briefings and discipline training. It is recommended that FEMA amend its ICS procedures to reflect the benefit of instituting a pre-shift briefing. By building relationships with a police or fire counterpart during briefings and showing discipline on an emergency scene, the public at large will immediately benefit.

| **14. SUBJECT TERMS** airmanship, police, fire, incident command system, ICS, collaboration, active shooter, complexity, aviation, crew resource management, unified command, chaos, police fire divide, emergency management, emergency response, complex emergency, discipline, teamwork, team development, pre-flight briefing, handshake, introduction, pre-shift briefing | | **15. NUMBER OF PAGES** 111 |
|---|---|---|
| | | **16. PRICE CODE** |
| **17. SECURITY CLASSIFICATION OF REPORT** Unclassified | **18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified | **19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified | **20. LIMITATION OF ABSTRACT** UU |

THIS PAGE INTENTIONALLY LEFT BLANK

**AIRMANSHIP ON THE GROUND:
HOW THE AVIATION INDUSTRY CAN FUNDAMENTALLY CHANGE THE
WAY FIRST RESPONDERS MANAGE COMPLEX EMERGENCIES**

Ryan Fields-Spack
Lieutenant, Aurora Fire Department, Aurora, Colorado
B.S., B.A., University of Denver, 2005

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL
March 2015**

Author:          Ryan Fields-Spack

Approved by:     Christopher Bellavita
                 Thesis Co-Advisor

                 Paul Jonathan Smith
                 Thesis Co-Advisor

                 Mohammed Hafez
                 Chair, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

# ABSTRACT

Police and fire departments today are challenged with an increasing frequency of complex emergencies and a continuing cultural divide. Devoted people from both agencies are actively working to improve their response capability. Rather than solving the problem solely in house, other disciplines may be able to help. This thesis investigated what the aviation industry could teach the emergency services field about how to approach complex life-sensitive problems. A structured focused comparison model was used to evaluate aviation's use of Crew Resource Management, the pre-flight briefing, and the concept of airmanship in relation to how they may benefit the response capability of police and fire commanders at a combined emergency response. The research concludes that police and fire departments in the United States would immediately benefit from instituting joint pre-shift briefings and discipline training. It is recommended that FEMA amend its ICS procedures to reflect the benefit of instituting a pre-shift briefing. By building relationships with a police or fire counterpart during briefings and showing discipline on an emergency scene, the public at large will immediately benefit.

THIS PAGE INTENTIONALLY LEFT BLANK

# TABLE OF CONTENTS

# LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

# LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ATC | air traffic control |
| BOLO | be on the lookout |
| CFIT | controlled flight into terrain |
| CRM | crew resource management |
| DHS | Department of Homeland Security |
| EMS | emergency medical service |
| EMT | Emergency Medical Technician |
| FBI | Federal Bureau of Investigation |
| IC | incident command |
| ICS | incident command system |
| JFO | joint field office |
| NIMS | national incident management system |
| NOTAMS | notices to airmen |
| NTSB | National Transportation Safety Board |
| SFC | structured focused comparison |
| SOP | standard operating procedures |
| SWAT | special weapons and tactics |
| UC | unified command |

THIS PAGE INTENTIONALLY LEFT BLANK

# EXECUTIVE SUMMARY

**Problem Statement/Topic**

In general, police and fire departments face three types of emergencies today. Two types encompass the normal "everyday" emergency. These are emergencies where either police are in charge or those where fire officers are in charge. However, there are emergencies that manifest themselves in a wholly different manner—the third type. These types of emergencies prove more complex than ordinary emergencies where police and fire commanders understand the breadth of the division of labor. Complex emergencies—those where both police and fire agencies must actively engage in their specific tasks at the same time and in the same geographic space—largely constitute a new challenge for police and fire commanders. Complex emergencies would be ones such as an active shooter, arson with a barricaded party, police officer injury, etc.

How might police and fire agencies adapt to the increasing number of complex emergencies where they will need to work together on scenes? Devoted people from both agencies are actively working to improve their own agency's response capability. Rather than solving the problem solely in house, the incorporation of smart practices of other disciplines may help. The use of some of the researched and proven smart practices of other disciplines could serve as a springboard to effective improvement in response. Aviation is one industry that has faced similar challenges in recent decades. It has developed concrete practices that directly address problems related to effective collaboration in a complex environment. This thesis seeks to analyze those practices and apply the principles to police and fire preparation and response capabilities.

**Research Question**

What can the aviation industry teach the emergency services field about how to approach complex life-sensitive problems?

**Method/Design Steps**

The research design and method for this thesis includes the following components:

*Object/Sample*

Research for this thesis focuses on the aviation industry. More specifically, the focus is on how pilots prepare for and react to potential catastrophic situations while in flight. This research is then synthesized for corollary opportunities in the emergency services field.

*Selection Rationale*

The research continually strives to identify how complex, life safety problems are resolved in the safest and most efficient way possible. The overall purpose of the research is guided by the primary objective of a police and fire department: fix problems as efficiently as possible with a preeminent focus on life safety. Given this goal, the airline industry was selected because of its longstanding history of overcoming faults; developing solutions to complex, life safety problems; and the fact that is has become a model for safety today.

*Limitations*

This thesis focuses primarily on lessons that can be learned. While opportunities for implementation of those lessons is explored, it does not provide specific, step-by-step methods for incorporating those lessons learned by a police or fire department.

*Steps of Analysis*

In order to answer the research question, a structured focused comparison (SFC) model is used. SFC is an ideal research method for this thesis in that it allows for a structured look into the aviation industry while requiring a focused extraction of information that is solely relates to the research question. SFC is used as the primary research method because it provides a sound framework from which to begin—and stay true to—the inquiry.

**Findings**

The research found that four specific principles of aviation's approach to complex, life-sensitive problems, can be directly applied to how police and fire agencies prepare for and respond to complex emergencies. Those principles include:

The introduction: the siloed nature of police and fire departments mean that many individuals have never met one another. Aviation suggests that formal opportunities for crew members to shake hands and introduce one another by first name is critical to the success of a team.

Teamwork: the aviation industry suggests that cultivating a swift starting team where all members trust one another explicitly is key to productive and safe operations.

The pre-flight briefing: aviation professionals conduct a joint pre-flight briefing in collaboration with all members of the flight process (e.g., ground crew, administration, air traffic control, flight attendants, cockpit crew). It is established protocol that the briefing is conducted before every single flight, *no matter what*.

Airmanship: the concept of airmanship in the cockpit is noted as directly responsible for alleviating dangerous situations while in flight.

**Recommendations**

This thesis has three specific recommendations:

1. Amend Federal Emergency Management Agency (FEMA) national incident management system and incident command system doctrine to include the implementation of a pre-shift briefing as a requirement for police and fire agencies.
2. Have police and fire commanders conduct daily strategic-level pre-shift briefings between police and fire commanders.
3. Implement a requirement for all strategic police and fire commanders to practice discipline (airmanship) when managing a complex emergency.

**Implementation**

In order to implement these recommendations, a working group is suggested to review and study how best to implement them. The working group will be chaired by a high-level FEMA representative with representation from all levels of emergency response.

**Contribution**

Complex life-safety emergencies are increasing in frequency. The Federal Bureau of Investigation recently published a report that active-shooter incidents have increased

by 40 percent since 2007.[1] Consequently, the requirement for police and fire agencies to work together in complex environments will also continue to increase. The incorporation of the pre-shift briefing and discipline into daily joint activities between police and fire will immediately improve upon their ability to address that threat.

---

[1] John Peterson, and Katherine W. Schweit, *A Study of Active Shooter Incidents in the United States between 2000 and 2013* (Washington, DC: U.S. Federal Bureau of Investigation and Texas State University Blair, 2013).

# ACKNOWLEDGMENTS

THIS PAGE INTENTIONALLY LEFT BLANK

# I.    INTRODUCTION

In general, police and fire departments face three types of emergencies today. Two types encompass the normal "everyday" emergency. These normal emergencies are those where police are in charge and those where fire officers are in charge. Everyday police emergencies include incidents like a hostage negotiation, bank robbery, SWAT activation, drug investigation, or homicide. These—and other incidents like them—are the explicit legal purview of the police department. Any other agencies, such as fire or ambulance, are merely assisting in the police investigation. The other "everyday" type of emergency happens typically under the purview of the fire department. These types of emergencies may include a structure fire, car crash, search and rescue, smoke investigation, medical problem, ambulance transport, or wildfire. Police merely assist the fire department in activities relevant to bringing the fire-centric scene to a conclusion.

Complex emergencies are those that manifest themselves in a wholly different manner. These types of emergencies prove more complex than the everyday ones where police and fire commanders understand the breadth of the division of labor. Complex emergencies—those where both police and fire agencies must actively engage in their specific tasks at the same time and in the same geographic space—largely constitute a new challenge for police and fire commanders. These complex emergencies are increasing in frequency. The Federal Bureau of Investigation (FBI) recently published a study that today's emergency response agencies face a 40 percent increase in active shooter threats since 2007.[1] While that study provides research showing an increase in active shooter events,[2] this thesis does not focus strictly on shootings as a source of complexity in emergency response. Rather, for the purpose of this research, complex emergencies are presented by the author to encompass more than an active shooter event. For this thesis, complex emergencies can include a bar fight, arson with a barricaded party, injured hostage, overdose, suicide, behavioral problem, injured police officer,

---

[1] John Peterson, and Katherine W. Schweit, *A Study of Active Shooter Incidents in the United States between 2000 and 2013* (Washington, DC: U.S. Federal Bureau of Investigation and Texas State University Blair, 2013), 6.

[2] Ibid.

bombing, or terrorist attack. Each of these emergencies requires both police and fire to engage in their specific duties immediately. It is that dynamic—engagement together—that has instigated episodes of conflict between police and fire commanders in past incidents. It is that 40 percent increase in frequency though that imparts a pause on the emergency services field as a whole. As complex emergencies are occurring at an increasing rate, and—as will be assessed in future chapters—the divide between police and fire is not improving, how might police and fire adapt to the changing environment?

Any police or fire chiefs worth their salt will not stand by, refusing to adapt to a change in threats their departments may be facing. Quite to the opposite; many chiefs will enlist their staff to devise a protocol, develop a training plan for their department, and implement a change. Rather than building protocol and training from the ground up, relying on police or fire staff to devise a new approach—is it possible that other industries have undergone a similar need for adaptation? Can the emergency response world learn from the lessons of those industries? Research shows that many industries have faced a challenge where refusing to change their method of operations would have resulted in injury or death to the people receiving their services. Similarly, conflict between police and fire during a complex emergency could lead to a diminished capacity to save lives.

One industry has faced and overcome that challenge in recent history: aviation. Just like emergency service responders of today, the aviation industry has faced two distinct watershed moments in its history. Each of these moments has required members of the aviation industry to step back and fundamentally shift their operational structure to insure that more complex aircraft can be flown safely. As a result, aviation has become a model of safety; however, can the corollary similarities between aviation and emergency response be robust enough to supplant the differences? Should the nation's police and fire chiefs take a stern look at aviation policies, procedures, and practices as a guide for change in their departments? This thesis will provide an objective assessment of those aviation practices and provide specific corollary opportunities that police and fire agencies can implement to improve how they respond to complex emergencies.

## A.    PRESENT-DAY ROLE OF THE FIRE DEPARTMENT

Despite their name, today's firefighter does not fight all that much fire. In fact, "of the roughly 30 million calls America's fire departments responded to in 2011…only about 1.4 million were fire-related—down by more than 50 percent since 1981."[3] For example, the Boston Fire Department had 417 structure fires in 1975 and only 40 in 2012, which is a decrease of over 90 percent.[4] Fire departments have thus changed their approach; these days, most fire departments are all hazards departments. This means that they are capable of providing an initial response to any type of emergency, and increasingly, those emergencies consist primarily of emergency medical incidents. Fire departments have thus embraced emergency medicine as one of their primary roles. The makeup varies across the U.S.; however, in a majority of metropolitan areas, one who dials 9-1-1 for a medical problem will often see a fire apparatus and an ambulance arriving to help. Ambulance providers vary widely from privately owned, to county managed, to being fully run by the fire department. Thus, for the purpose of simplicity in this thesis, the individuals and resources dedicated to all non-law-enforcement activity on complex emergency will be referred to as "fire."

## B.    ANATOMY OF A COMPLEX EMERGENCY

For the purpose of this thesis, a complex emergency is perceived as any emergency where both police officers and firefighters must actively engage in their respective duties—immediately upon arrival to the incident—and work alongside one another in the same geographical space. It is more complex than a single agency emergency because the problem that necessitated the response and action of both police and fire will often require a unified command structure that is outside of a typically understood approach. For example, a shooting in a bar at 2am on a Friday night where patrons are highly agitated and hostile will require police to apprehend the shooter, separate the hostile parties, investigate the crime, interview witnesses, and stop any further violence. Fire will need to set up a medical branch for all injured parties. In

---

[3] Leon Neyfakh, "Plenty of Firefighters, but Where Are the Fires?," *Boston Globe*, September 8, 2013.

[4] Ibid.

addition, they will need to enter the bar under the protection of police; extricate victims; preserve evidence; and triage, treat, and transport all patients to an emergency department. In order to facilitate all of these tasks safely and efficiently, the police and fire officers in charge of that scene need to be working closely with one another.

A complex incident can manifest itself in small and large ways. Even an emergency as common-place as a heroin overdose in a bar can be a microcosm of a complex emergency. For example, entering the bathroom of an unkept bar and finding an unconscious six foot five inch male with a needle in his arm sets a distinct and unsettling tone for police, fire, and ambulance personnel who are called there. This emergency has a real potential to go very badly if those agents do not work together as a team to get to know the true enemy—heroin. If the paramedic charged with caring for that patient gives the narcotic reversal drug Narcan without coordination, the patient will immediately wake up and become extremely violent. He will quickly overpower the members on the scene. Police—who may have a limited knowledge of what is happening—may be forced to revert to their training for subduing a hostile person. An individual that size, acting that violently, could incite an escalation in response from the police that may well cause injury.

While that overdose incident only requires the presence of one fire apparatus, ambulance personnel, and a handful of police officers, it still illustrates how a complex incident can manifest itself. Police are understandably on edge in a bar with a potentially hostile individual who is on drugs. Additionally, fire is tasked with treating that patient at the same time. The crew that is working in that bathroom must coordinate well with one another lest confusion about specific actions lead to the patient, or any of the responders, to get injured. This is where best practices honed in other industries, such aviation, can be beneficial.

As will be specifically assessed in future chapters, aviation has developed specific tools in the form of crew resource management (CRM), airmanship (discipline), and briefings that insure that even the smallest of complex scenarios are addressed in the same way and with exceptional consistency. These principles are incorporated, every

time, whether the airline crews have worked together before or not. As will be shown, those same aviation principles could be beneficial to emergency responders as well.

## C.     THE LARGE SCALE, COMPLEX, POLICE/FIRE EMERGENCY

The habits built on a small incident, like the heroin example above, have the potential to manifest themselves on a much larger incident. Like that small overdose emergency, the same principles of communication, coordination, and unified action in that bar are likewise required for a large-scale, active shooter event in a school—the wheel is just bigger. An active shooter in a mall, school, theater, or on a military base are the most widely covered in the media today. Response to an active shooter event will likely be a once in a career challenge for a commander. That complex emergency can expand dramatically and present both police and fire responders with immediate requirements, including stopping the violence, apprehending a suspect, finding injured citizens, coordinating incoming resources, extracting victims, preserving evidence, and transporting victims to the hospital. Additionally, all of those problems present themselves in a highly stressful environment.

Managing all of those needs while under such stress can tax any responder; however, managing stressors like those are not exclusive to police and fire. Aviation professionals face corollary stressors also and have spent decades perfecting a unique approach. Aviation principles, though unmistakably different from those of fire and police in many respects, have real applicability to aid the decision making capability and discipline that commanders could use to make the most prudent decisions at that active shooter event.

## D.     THE LARGE SCALE, COMPLEX, AVIATION EMERGENCY

Like a police or fire commander, airline pilots, too, have the chance of facing a once in a career challenge of similar complexity. Captain Chesley "Sully" Sullenberger recounts his once in a career experience at the controls of U.S. Airways flight 1549, which landed in the Hudson river in New York City:

> I could feel the momentum stopping and the airplane slowing. I sensed that both engines were winding down…If only one engine had been

destroyed, the plane would be yawing, turning slightly to one side because of the thrust in the still working engine. That didn't happen. So I knew very quickly that this was an unparalleled crisis. The Failure of one engine had never happened to me before. Engines are so reliable these days, that it is possible for a professional airplane pilot to go an entire career without losing even one. I was headed for that perfect record before flight 1549...Within eight seconds of the bird strike, realizing we were without engines, I realized that this was the worst aviation challenge I'd ever faced. It was the most sickening, pit of your stomach falling through the floor feeling I had ever experienced.[5]

Though the chances of facing a once in a lifetime emergency are equally remote for both emergency response agencies and aviation pilots, the difference in preparation for such situations between the industries is stark. Captain Richard de Crespigny experienced a once in a lifetime emergency as the pilot of Qantas Airlines flight 32, which experienced a critical engine failure in November 2010. Captain de Crespigny was the pilot of Qantas Airlines flight 32 (QF32), which experienced a critical engine failure. QF32 was the flight number for the Singapore to Sydney route on the Qantas's Airbus 380 (A380) double decker aircraft. The A380 is one of the largest passenger airlines in the world. Captain de Crespigny had 35 years of experience as a pilot and was well versed in the aviation principles of crew resource management, airmanship, and teamwork. Captain de Crespigny wrote a firsthand account of his experience upon takeoff of QF32. He explains:

At 10.01 am I was about to turn off the seatbelt signs when . . . BOOM. I looked to my right to see if Matt had heard it too. BOOM! This one was louder than the first and the airframe shuddered. 'Bing-bing-bing-bing-bing . . .' The master warning system was set off. The first sound was like a backfiring car, and could easily have been the noise resulting from an engine surge we get from time to time on the big jets …But the second boom was like nothing I'd experienced before. Two booms one second apart. Was it the first engine having more grief or had I lost another engine? There was no time to think . . . 'Bing-bing-bing-bing-bing . . .' There were two master warning lights: one in front of Matt's eyes and one in front of mine. Big red lights to grab our attention in only the worst

---

[5] Chesley Sullenberger, and Jeffrey Zaslow, *Highest Duty: My Search for What Really Matters* (New York: William Morrow, 2009), 209–10.

emergencies. They were both lit up in brilliant red. My mind raced, my senses of sight, sound and touch were in overdrive.[6]

Captain de Crespigny faced a very rare situation onboard that A380—an engine explosion in an airline with nearly 500 people on board is a complex emergency. Bringing that emergency to a safe conclusion took over 80 years of combined effort to change the culture of an industry. That cultural shift was made possible in the form of crew resource management, airmanship, and briefing techniques, and as a result, Captain de Crespigny was prepared. Furthermore, those researched, tried, and true efforts have resulted in aviation being the model for safety and operations in the world. The corollary similarities of how those principles can be adapted to emergency response is the preeminent focus of this thesis. Forthcoming chapters will begin the process of building that bridge.

## E.    HYPOTHESIS

Police and fire departments today are challenged with an increasing frequency of complex emergencies and a continuing cultural divide. Devoted people from both agencies are actively working to improve their own agencies' response capability; however, rather than solving the problem solely in house, the use of some of the researched and proven smart practices of other disciplines could serve as a springboard to effective improvement in response.

## F.    RESEARCH QUESTION

What can the aviation industry teach the emergency services field about how to approach complex—life sensitive—problems?

---

[6] Richard de Crespigny, *Qf32* (Sydney, Australia: Pan Macmillan Australia, 2012), Kindle location 1718–59.

## G.    RESEARCH DESIGN

The research design and method for this thesis includes the following components.

### (1)    Object/Sample

Research for this thesis focus on the aviation industry. More specifically, the thesis explores how pilots prepare for, and react to potential catastrophic situations while in flight. This research will then be synthesized for corollary opportunities in the emergency services field.

### (2)    Selection Rationale

This research continually strives to identify how complex, life safety problems are resolved in the safest and most efficient way possible. The overall purpose of this thesis is guided by the primary objective of a police and fire department: fix the problem as efficiently as possible, and the preeminent focus is on life safety. Given this goal, the airline industry has been selected because of its longstanding history of overcoming faults and development solutions to complex, life safety problems, and because of the fact that it has become a model for safety today.

### (3)    Limitations

This thesis focuses primarily on lessons that can be learned. While opportunities for implementation of those lessons are explored, it does not provide specific, step-by-step methods for incorporating those lessons learned into a police or fire department.

### (4)    Steps of Analysis

To answer the research question, a structured focused comparison (SFC) model is implemented. SFC is an ideal research method for this thesis in that it allows for a structured look into the aviation industry while requiring a focused extraction of information that is solely related to the research question. Additionally, SFC is used as the primary research method because it provides a sound framework from which to begin—and stay true to—the inquiry. The SFC method will be broken out as follows.

*Structured:* Given the wide amount of information available on aviation, structure is provided by asking the following question about that industry: How are complex, life safety, problems resolved in the safest and most efficient way possible? This question guides the data collection.[7]

*Focused:* The research is strictly focused. Specifically, analysis focuses on how the aviation industry prepares for and responds to complex problems that could have a direct implication for life safety.[8]

*Complex Problems:* For this research, complex problems are regarded as problems that cannot be specifically planned for. Additionally, they are problems that manifest in different ways, at different and unexpected times, and, if not immediately remedied, they could have a direct and detrimental effect on the lives of those affected by failure to remedy the problem.

*Life Safety:* While complex problems can occur in aviation, if not addressing them does not result in and eventual or probable loss of life, correlations to complex emergencies like and active shooter are not as relevant in final analysis.

(5)    Output

The research design for this thesis assesses aviation practice and provides direct corollary insight into how those practices can improve the response to complex emergencies by police and fire. It provides detailed examples of how said insight could manifest in the day-to-day activity of police and fire responders. Furthermore, this thesis serves as a start point for additional research into how practices of the airline industry can be directly applied to protocols and training plans of individual departments.

## H.    HOW TO FIX THE PROBLEM

Many accomplished scholars and emergency service professionals readily acknowledge that there are indeed challenges to facilitating collaboration at a high stress or large scale emergency. Naturally, published work on the subject seeks to ascertain why

---

[7] Ibid.

[8] Ibid.

it is taking place. However, much less effort has been given to providing concrete, actionable opportunities to improve synergy between police and fire during an active shooter incident.

Joseph Pfeifer speaks to the need for more actionable research in his statement that future literature "could focus on inter-organizational decision-making."[9] He also asks, "If collaboration is essential to incident management at extreme events, how do organizations make decisions in a unified command structure?"[10] This thesis seeks to pave a path to meaningful change in inter-organizational decision making. Federal mandates, fire based command structure, and ubiquitous media accounts have not made the necessary headway to improving the response ability of police and fire agencies. Other industries have faced similar challenges and have overcome those challenges. It is time for police and fire departments to look to them for insight.

## I.    TO THE SKEPTICS

It is understandable that one may be skeptical about a thesis claiming that principles leading to landing a plane safely can provide insight into running the scene of a shooting in a busy night club. However, this thesis will demonstrate just that. In addition, police and fire would not be the first to draw upon the principles of the aviation industry; the medical industry is too.

As will be noted in the literature review, the medical industry too is actively researching and enacting the principles of aviation within the walls of a hospital. The pushback on the part of many in the medical profession was profound when the subject was first broached. As stated in the work of Gordon, Mendenhall, and O'Connor,

> One head of curriculum at a large American medical school once told us,
> 'Health care is so much more complex than aviation. After all, in aviation

---

[9] Joseph W. Pfeifer, *Crisis Leadership: The Art of Adapting to Extreme Events* (Cambridge, MA: Harvard Kennedy School Program on Crisis Leadership, 2013), http://www.hks harvard.edu/content/download/67377/1242318/version/1/file/Pfeifer+Crisis+Leadership--March+20+2013.pdf, 19.

[10] Ibid.

it's just two guys in a box, and flying a 747 isn't that different than flying a Cessna.'[11]

While it is true that one pilot is in charge, the cockpit door is locked tight, and the cabin staff cannot fly, taking this at face value would mean negligently ignoring all of the processes and procedures that led up to the moment that cockpit door is closed and locked.

Suzanne Gordon and her colleagues speak directly to this skepticism in their book *Beyond the Checklist*. In addition, they suggest:

> to focus only on the differences between the two endeavors…is to ignore the very important structural similarities that make the CRM model a useful and readily adaptable foundation for beneficial change in health care. No one can prove who experiences more job stress or complex responsibility, and in the end this is a spurious debate.[12]

It is readily acknowledged that there are stark differences between a pilot in an aircraft and two unified commanders on an emergency scene. The pilot is in charge of the whole operation. What she says, goes. In a unified command on an emergency, both commanders, by proxy, are in charge of the situation; however, they are also the ultimate command authority in all actions conducted by their respective subordinate members. Bringing a plane back to the ground safely requires much more than just one pilot. Likewise, stopping violence, extricating victims, and treating and transporting them to the hospital requires a carefully coordinated team of professionals.

One may argue that the flight crew is thoroughly trained on situations that could occur (e.g., flight simulators) and how they work as a team in response. The comprehensive use of flight simulators is an important part of aviation safety, and there are many technological companies designing simulation software for police and fire agencies to practice their interagency responses just like pilots do. Thus, one may make

---

[11]Suzanne Gordon, Patrick Mendenhall, and Bonnie Blair O'Connor, *Beyond the Checklist: What Else Health Care Can Learn from Aviation Teamwork and Safety* (Ithaca, NY: ILR Press: 2013): Kindle location 421–22.

[12]Ibid., Kindle location 426–29.

the argument that police and fire agencies should embark on mandatory simulator training as a part of their duties.

Others may argue that aviation members all embrace the same culture and thereby automatically work better together. This argument neglects the fact that the symbiotic relationship that exists today was much more divisive in decades past. Prior to full scale implementation of crew resource management (CRM) principles, there was a profound divide in the culture of members on a plane. Robert Francis, vice chairman of the national transportation safety board (NTSB), is quoted as saying:

> thirty years ago the captain would come in to the cockpit and either directly or indirectly convey the following to the first officer and flight engineer, 'I'm the captain. I'm king. Don't do anything, don't say anything. Don't touch anything. Shut up!' Now, it's 'I'm the captain, I'm king. Please tell me if you see me making a mistake.' The result: There are fewer airplane crashes and far less tension in workplace relationships.[13]

It is thus not about the one incident commander who is in charge, it is a process whereby a group of people can work together to fix a problem. Yes, police and fire commanders are king in their own plane, but the tools provided by CRM can help to facilitate an environment where both of those commanders come together to solve the problem with a singular vision.

Aviation's principles have grown to be much more than just "the pilots locked in a box." It is the comprehensive approach to safety that proves applicable to the police and fire response dynamic. Research into CRM shows that:

> over time, CRM has been expanded beyond the crew inside the aircraft (i.e., pilots and flight attendants) to include other specialties—handlers, dispatchers, and mechanics, as well as resources outside the bounds of the company. All of this has produced a keen sense of team intelligence and recognition of 'distributed cognition, which has produced greater safety across the industry.[14]

It is precisely that team intelligence and recognition of distributed cognition that could be of benefit to two commanders at an emergency. Bringing an incident of arson

---

[13] Ibid., Kindle location 210–12.

[14] Ibid., Kindle location 361–63.

with a barricaded party to a safe conclusion takes a distributed effort on the part of firefighters, engineers, fire officers, SWAT teams, patrol officers, dispatchers, and administration—with the commanders merely attempting to coordinate the chaos.

Gordon et al. pose the following question:

> …how can the responsible parties in any industry or organization best function to protect those who depend on their skills and professional judgment for survival? We can learn from best practices and relevant models wherever and whenever they are developed and then adapt them to different settings in which they may be useful…What is paramount is how an institution—or, in the case of CRM, an entire global industry—learned to change for the better and for the safer and how it has sustained change over time.[15]

Captain Sullenberger, with all of his fame and accolades as a master of his craft, readily acknowledges the need to learn from others:

> we must have the integrity to do all the right things…we need to keep renewing our investments in people, systems and technology to maintain the high level we all deserve, we have to choose to do this. That is why, long before flight 1549, I read about, and learned from, the experiences of others. It matters.[16]

That is why long before flight 1549, Captain Sullenberger started a company "designed to help those in other occupations benefits from the airline's strategic approaches to safety."[17]

This thesis will provide recommendations for change. Change though is an ancillary benefit to opening one's mind to the notion that other industries have invested significant time, effort, and money into improving themselves. Today's police and fire agencies have a duty to continue to adapt to the challenges of tomorrow. If even a small portion of the aviation industry can teach a police or fire commander how to save just one more life, might it be worth the effort? This thesis will present tools that are unquestionably proven to improve teamwork, communication, and discipline. There

---

[15]Ibid., Kindle location 435–37.

[16] Sullenberger and Zaslow, *Highest Duty: My Search for What Really Matters*, 43.

[17] Ibid., 23.

cannot be an apples to apples comparison between the two industries; however, the correlations presented herein are a potential game changer for the future of emergency response. For as Sully said, learn from "the experience of others. It matters."[18]

## J.     CHAPTER PREVIEW

This thesis will follow a path designed to provide strict correlation between the practices of aviation and the potential implantable correlations that can be applicable to police and fire departments as they respond to tomorrow's emergency.

- Chapter II will provide a comprehensive review of the literature. Included is a review of the emergency response to 9/11 and the resulting national incident management System (NIMS); review of the incident command System (ICS); review of the divide between police and fire; and literature on the development of aviation safety practices.

- Chapter III will review the pre-flight approach to aviation. Three specific components of crew resource management will be assessed: the introduction, teamwork, and the pre-flight briefing.

- Chapter IV will assess the in-flight approach to aviation. Chiefly, the concept of airmanship and the benefits it brings to managing complex situations will be assessed.

- Finally, Chapter V will conclude by providing recommendations based on the assessment of the aviation industry practices. Broad implementation tactics will also be provided.

This thesis recommends embracing many facets of aviation culture and training principles. Many of those concepts are starkly different from the method of operations of police and fire departments today. As such, to highlight and embrace those differences, this thesis will reflect a tone of aviation lexicon to reinforce them. The use of the terms of pre-flight, in-flight, and post-flight also provide a degree of neutrality, regardless of the background one may have. Police and fire officers use different terminology in daily operations. In order for each agency to embrace new concepts and practices, using a neutral term that is new to both agencies may allow for improved acceptance.

---

[18] Ibid., 43.

14

## II.    LITERATURE REVIEW

This literature review considers the current material available for inclusion into this thesis. It reviews research provided via academic journals, books, media publications, academic magazines, and government documents. To facilitate assessment of the corollary opportunities between the aviation principles to that of police and fire, this review details the emergency response to the 9/11 attacks, national incident management system, incident command system, and the divide between police and fire agencies. Additionally, Chapter II reviews the literature pertaining to the early development of aviation safety practices. Those practices and the reasons that they came to be are beneficial when assessing the similarities of the divide between police and fire.

### A.    LITERATURE ON THE EMERGENCY RESPONSE TO 9/11 AND NIMS REQUIREMENT

In the wake of the September 11, 2001, attacks, the 9/11 Commission report announced that improvements need to be made in how emergency response agencies collaborate on large scale incidents:

> the attacks on 9/11 demonstrated that even the most robust emergency response capabilities can be overwhelmed if the attack is large enough. Teamwork, collaboration and cooperation at an incident site are critical to a successful response. Key decision makers who are represented at the incident command level help to insure an effective response, the efficient use of resources, and responder safety. Regular joint training at all levels is, moreover, essential to insuring close coordination during an actual incident.[19]

This statement on the part of the 9/11 Commission sparked a wave of change for much of the emergency response community.

Recommendations for change include the consolidation of multiple agencies into one Department of Homeland Security, the expansion of information sharing,

---

[19] National Commission on Terrorist Attacks upon the United States [9/11 Commission], *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States* (New York: W. W. Norton, 2004), 413.

strengthening the screening process for airlines, and protection of critical infrastructure.[20] Most specifically, for the purpose of this thesis, changes include the requirement for all agencies to adopt the national incident management system (NIMS) in order to receive federal funding.[21]

NIMS outlined the framework for a nationalized response model in America. John Esposito summarizes:

> the NIMS published by the United States Department of Homeland Security (DHS) in 2004, and updated in 2008, 'provides a consistent nationwide template to enable federal, state, local and tribal governments…to work together effectively and efficiently' to respond to domestic incidents. NIMS outlines a comprehensive way to establish a compliant incident management system.[22]

NIMS is not used to manage an incident; however, the command and control process of NIMS is the Incident Command System (ICS).

## B.     LITERATURE ON THE INCIDENT COMMAND SYSTEM

ICS was developed in the early 1970s by Calfire (the state sponsored wildfire agency in California). It developed a method for coordinating firefighting efforts from lessons learned when working with multiple agencies throughout the state on fires. An example of some of the problems they faced was the fact that a volunteer department, a professional paid department, and assets from Calfire all had separate jargon, education, and command approaches. This led to dangerous conflicts of interest on a fast moving fire incident. Thus, Calfire adopted an early version of the ICS.[23] In 1983, "the U.S.

---

[20] U.S. Department of Homeland Security, *Implementing 9/11 Commission Recommendations: Progress Report 2011* (Washington, DC: U.S. Department of Homeland Security, 2011), 3–4.

[21] White House Office of the Press Secretary, *Homeland Security Presidential Directive/Hspd-5 Management of Domestic Incidents*, White House Office of the Press Secretary, accessed March 12, 2015, http://www.whitehouse.gov/news/releases/2003/02/20030228-9 html

[22] John M. Esposito, "New York City Fire Department Chief Officer's Evaluation of the Citywide Incident Management System as It Pertains to Interagency Emergency Response" (master's thesis, Naval Postgraduate School, 2011), 7.

[23] Dick A. Buck, Joseph E. Trainor, and Benigno E. Aguirre, "A Critical Evaluation of the Incident Command System and NIMS," *Journal of Homeland Security and Emergency Management* 3, no. 3 (2006): 11.

Forest Service, Bureau of Land Management, and National Park Service adopted ICS, calling it the National Interagency Incident Management System."[24]

In a nutshell, ICS is a uniform and universal method for command and control on an emergency incident. Buck, Trainor, and Aguirre from the University of Delaware summarize ICS, "It provides a set of rules and practices to guide the actions of the various organizations responding to disaster, and creates the necessary division of labor and coordination mechanisms among them."[25] In addition, Bigley and Roberts write, "in general, the ICS is constructed around five major functions: command, planning, operations, logistics, and finance/administration. These building blocks purportedly apply in both routine and non-routine situations and for ICS structures of all sizes."[26]

Buck and his colleagues provide a succinct summary of how ICS is designed to work on an emergency scene:

> [ICS] includes some of the following program elements: standardized job descriptions with a training program for those positions; common terms for equipment and supplies; a structured chain of command from the specialist on the ground to the incident commander with unity of command emphasized and each person in the organization reporting to one boss; authority commensurate with responsibility, and task assignments made rationally to the person most qualified for the assignment regardless of rank in the organization; span of control limited to the number of people that one person can effectively control; sectoring of work to insure efficiency, effectiveness and safety; finally ICS is based on the scalar principle, with its size and complexity depending on the size and complexity of the disaster or emergency incident to which it is applied.[27]

Another core component to ICS is the benefits of a unified command (UC) during complex, multiagency emergencies. A unified command, as defined by the Phoenix Fire Department, is "a structure that brings together the incident commanders of major organizations involved in the incident in order to coordinate an effective response while

---

[24] Ibid., 1.

[25] Ibid., 11.

[26] Gregory A. Roberts, and Karlene H. Bigley, "The Incident Command System: High-Reliability Organizing for Complex and Volatile Task Environments," *Academy of Management Journal* 44, no. 6 (2001): 1282.

[27] Buck, Trainor, and Aguirre, "A Critical Evaluation of the Incident Command System and NIMS," 1.

at the same time carrying out their own jurisdictional responsibilities."[28] Furthermore, Phoenix Fire requires that "a formalized Unified Command (UC) should be established as soon as possible" when faced with a police/fire combined event.[29] The Aurora, Colorado police department includes similar language in their written policies as well: "the APD incident command will, as early in the incident as is practical, establish face-to-face communication with Aurora Fire command to unify command and coordinate the extraction teams."[30] In addition, the Office of the Secretary of Defense recommends the use of a UC, stating commanders on a complex incident are "responsible for performing two separate and distinct but related jobs with two separate and distinct teams for two separate and distinct bosses, all at the same time."[31] The concept of the incident command system has been embraced—on paper—by many police and fire departments. There are times though when training and the need to act on an emergency scene take a front seat to the ICS principles that are recommended.

While the components of ICS seem understandable on its face, there are many instances, both at the federal local levels, where ICS has failed to be implemented correctly. Jessica Jensen and Waugh quotes a 2006 National Research Council report stating:

> problems commonly associated with response to large-scale incidents include. . . 'failure to recognize the magnitude and seriousness of an event; delayed and insufficient responses; confusion regarding authorities and responsibilities, often resulting in major 'turf battles'; resource shortages and misdirection of existing resources; poor organizational, inter-organizational, and public communications; failures in intergovernmental

---

[28] Phoenix Fire Department, "Phoenix Regional Standard Operating Procedures: Operations at Violent Incidents," in *Protocol MP 206.01* (Phoenix, AZ: City of Phoenix, AZ), 5.

[29] Ibid., 5.

[30] City of Aurora Police Department, "Active Critical Incidents Directives Manual," in *Protocol 12.9*, (Aurora, CO: City of Aurora, 2013), 2.

[31] Ryan Burke, "Out with the Old, in with the New: Embracing Dual Status Commanders in the Future of Homeland Defense and Security," 2014, https://www.hsdl.org/?view&did=754722, 15.

coordination; failures in leadership and vision; inequities in the provision of disaster assistance . . ."[32]

Vinicio Mata provides an account of such a failure in the response to Hurricane Katrina when he remarks, "the JFO [Joint Field Office] staff and other deployed Federal personnel often lacked a working knowledge of NIMS or even a basic understanding of ICS principles."[33] Furthermore, Jensen and Waugh assess the failure to implement ICS in the U.S. by suggesting that "response efforts have often been characterized as inefficient, wasteful, and/or ineffective. Despite a variety of national level efforts to minimize the effect of, if not eliminate, common response issues, the problem has endured."[34]

Though the incipient phase of ICS started with the need to manage forest fires, Thomas Creamer justifies the federal stance that ICS priorities are beneficial to all emergency incidents: "fire, EMS, and police operations at a terrorist incident, though uniquely different,…are most often completely dependent on each other for a successful outcome."[35] Additionally, he asserts, "the ability of law enforcement, fire service, and EMS personnel to coordinate, cooperate, and communicate precisely is paramount to an effective public safety response."[36] The challenges faced by police and fire agencies in using ICS effectively are compounded by the specific differences between them.

## C.      ASSESSMENT OF THE DIVIDE BETWEEN POLICE AND FIRE AGENCIES

The press and scholarly works report on the divide between police and fire agencies. Many of the following accounts that highlighting that divide are reviewed. In New York, 2003: a *New York Times* article by Michael Brick recounted an incident in 2003 between police and fire. Brick explains:

---

[32] Jessica Jensen, and William L. Waugh, "The United States' Experience with the Incident Command System: What We Think We Know and What We Need to Know More About," *Journal of Contingencies and Crisis Management* 22, no. 1 (2014): 6.

[33] Vinicio R. Mata, "The Contribution of Police and Fire Consolidation to the Homeland Security Mission" (master's thesis, Naval Postgraduate School, 2010), 4.

[34] Jensen and Waugh, "The United States' Experience with the Incident Command System," 6.

[35] Thomas Creamer, "Multiagency Response to WMD," *Fire Engineering* (November 2005): 1.

[36] Ibid.

it started with a hopeless would-be-burglar stuck in a chimney in Queens. Add a few hours in the sweltering city, a scuffle between members of elite police and fire rescue units and a descending horde of television cameras, all of a sudden, the mayor was calling an emergency meeting with his top police and fire officials.[37]

In Phoenix, Arizona, in 2005, John Coleman quotes Steve Kreis in *Fire Engineering Magazine*:

every few years, we seem to come across a highway patrol officer who seems to believe that traffic flow is more important than our safety. The other day, for example, a highway patrol officer 'detained' one of our captains by handcuffing him, placing him in the back of the patrol car, and threatening to arrest him.[38]

In 2006, along with budget related issues, Donahue and Tuohy found that an overall theme in each incident stemmed from "uncoordinated leadership, failed communications, weak planning, and resource constraints."[39]

In New York, 2007: Joseph McGeary mentions the importance of communication and information when he quotes a *New York Times* article in his thesis:

communication and information sharing is essential for successful cooperation; but a lack of respect between these agencies for each other's' roles and responsibilities has even manifested itself, on occasion, with physical altercations between members, and a shouting match between the commissioners of these two agencies in front of reporters at City Hall. Generations of police officers and firefighters have come up through the ranks in this atmosphere which has helped institutionalize this hostility and has created an environment of competition and distrust.[40]

---

[37] Michael Brick, "Crime Scene or Rescue? Man in Chimney Causes a Clash," *New York Times*, June 28, 2003, B1.

[38] John Coleman, "Skip, "Working with the Police at MVAs," *Fire Engineering* 158, no. 3 (March 2005): 1.

[39] Amy K. Donahue, and Robert V. Tuohy, "Lessons We Don't Learn a Study of the Lessons of Disasters, Why We Repeat Them, and How We Can Learn Them," *Homeland Security Affairs* 2, no. 2 (2006): 4–8.

[40] Joseph P. McGeary, "Applying Goldwater-Nichols Reforms to Foster Interagency Cooperation between Public Safety Agencies in New York City" (master's thesis, Naval Postgraduate School, 2007), 1.

Four years later in 2011 in his thesis, John Esposito suggests:

the evidence shows that the different agencies are not operating in an integrated manner. If the agencies do not operate in a coordinated manner on a routine basis at the small incidents, they cannot be expected to operate in such a manner during a large-scale incident.[41]

In another *New York Times* article, in 2012, Al Baker reported that a high angle rescue

exposed the friction that often arises between the Police and Fire Departments' emergency responders, particularly when their work overlaps. At the heart of the conflict was a move by an Emergency Service Unit officer from the Police Department who rappelled down from the roof to the trapped workers even as firefighters had committed to retrieving them through the window.[42]

In Los Angeles, California, 2013, the associated press reported on a different aspect, the time delay. The report on the Los Angeles Airport shooting on November 1, 2013, commented:

it would be 33 minutes before Transportation Security Administration Officer Gerardo Hernandez, who was about 20 feet from an exit, would be wheeled out by police to an ambulance... "I basically think there's a lack of coordination between entities at this airport. That lack of coordination may have led to something that shouldn't have happened," Payes said. "We may be talking about Officer Hernandez as a survivor."[43]

In Aurora, Colorado 2014: the formal after action report for the Century Theater shooting on July 20, 2012 comments on the need for unified command. The report suggests: '

Police and fire commanders did not establish a unified command during the first hour and did not communicate effectively using available radio systems in the initial, critical minutes of response, triage and transport. No

---

[41] Esposito, "New York City Fire Department Chief Officer's Evaluation," 48.

[42] Al Baker, "17 Floors up, Rescue of 3 Shows Clash of Agencies," *New York Times*, April 14 2012, 1.

[43] Associate Press, "Lax Shooting Victim Bled Alone for 33 Minutes," *CBS News*, November 15, 2013, www.cbsnews.com/news/lax-shooting-victim-bled-alone-for-33-minutes-ap/

procedures were in place to ensure face-to-face contact or direct communications between police and fire incident commanders.[44]

The after action report (produced by TriData System Planning Corporation) identified other specific failures, which include:

- The police department was unable or did not know how to communicate directly with the fire department, in spite of a fully interoperable radio system. The fire incident commander was not immediately aware of the magnitude of the incident, and did not have an accurate picture of the risk level. Critical content was lost as information was relayed from police to fire through the Communications Center.[45]

- Police and fire department personnel did not participate in regular communications interoperability drills. The joint command communications problem contributed to not getting ambulances to victims that were reachable by police cars.[46]

Specific recommendations by TriData included the following three items:

- Public Safety Three-party Team. Foster more integration of planning and exercises among public safety communications, fire and police. Communications personnel felt there was not enough understanding, respect, and training among the agencies, and that emergency preparedness should be considered a three-legged stool.[47]

- Communications Interoperability Drills. The Communications Department should hold regular inter-department interoperability communications drills with all three agencies—police, fire, and public safety communications. Personnel of all three agencies should develop hands-on proficiency with their equipment. Human and equipment communications issues should be identified in joint mass casualty exercises, and remedied. The dispatch center should be involved in ICS training, which should include testing of proficiency in using the communications systems.[48]

- Simplify Operation of Radio System. The radio system needs to be reconfigured to make it simpler to use its interoperative capabilities.[49]

---

[44] TriData System Planning Corporation, *Aurora Century 16 Theater Shooting after Action Report for the City of Aurora, Colorado* [redacted and publically released version], (Arlington, VA: TriData System Planning Corporation, 2014), 27.

[45] Ibid., 23.

[46] Ibid.

[47] Ibid., 88.

[48] Ibid.

[49] Ibid., 89.

As noted above, multiple media and academic sources posit that there indeed is a divide between police and fire on emergency incidents. What is more, the literature shows that the divide has continued from 2003 to the present.

## D. LITERATURE ON THE EARLY DEVELOPMENT OF AVIATION SAFETY PRACTICES

The aviation industry has experienced significant accidents that have led to the development of specific tools that are now used every day to insure safety. In 2004, Phillip Meilinger wrote one of the most cited articles on aviation's need for improved safety procedures in his article entitled: "When the Fortress Went Down: The 1935 Crash of Boeing's Sleek, Four-Engine Bomber Set Back Airpower for Years," Meilinger speaks to the complexity of a new Boeing model 299 aircraft that crashed on October 30,1935 in Dayton, Ohio. In this article, Meilinger, cites the belief by some that this new type of airplane was too complex. He wrote that the "locking mechanism [on the wing] was controlled from inside the cockpit, but no one remembered to disengage it before takeoff."[50] In addition, he recounted, "The General staff advanced the view that, because the Boeing airplane had crashed, it must have been far too complex for anyone to handle safely."[51]

In 2013, Walter Boyne followed Meilinger's article with one of his own that expanded on the crash of the model 299 entitled "The Checklist." Boyne relayed one of the key assertions that is widely referenced by other industries to this day: "…the Air Corps faced arguments that the aircraft was too big to handle."[52]

Both Meilinger and Boyne provide insight into how the industry overcame the arguments. Most specifically, they present the assessment that the plane was not too complex, it was a task management and memory problem. Boyne references this point, "the Air Corps, however, properly recognized that the limiting factor here was human

---

[50] Phillip S. Meilinger, "When the Fortress Went Down the 1935 Crash of Boeing's Sleek, Four-Engine Bomber Set Back Airpower for Years," *Air Force Magazine* 87 (2004): 81.

[51] Ibid.

[52] Walter J. Boyne, "The Checklist," *Air Force Magazine* 96, no. 8 (2013): 54.

memory, not the aircraft's size or complexity."[53] Meilinger had a similar argument, "Airmen realized that aircraft were becoming too complex to fly safely without standardized procedures. Moreover, these procedures were too numerous and complicated to commit entirely to memory."[54]

The creation of the checklist as the solution to the complexity of the aircraft is well documented in the literature. Organizations, such as the Flight Service History group, have published accounts of how the checklist came about:

> The pilots sat down and put their heads together. What was needed was some way of making sure that everything was done; that nothing was overlooked. What resulted was a pilot's checklist. Actually, four checklists were developed—takeoff, flight, before landing, and after landing.[55]

Boyne echoes that assessment:

> To avoid another accident, Air Corps personnel developed checklists for the crew to follow…The basic concept had already been around for decades, and was in scattered use in aviation worldwide, but it took the Model 299 crash to institutionalize its use.[56]

In addition, Boyne suggests, "the success of aviation checklists led to their adoption by many other disciplines, including the quality assurance for software engineering, in civil litigation, and even in tracking and evaluating sports card collections."[57]

After establishing the checklist as a result of the 1935 flying fortress incident, aviation faced another time of change. As recounted by Kolbe Grote and his colleagues in their article entitled "Adaptive Coordination and Heedfulness Make Better Cockpit Crews." They write, "For the past three decades, reports from aircraft accidents and

---

[53] Ibid., 55.

[54] Meilinger, "When the Fortress Went Down," 82.

[55] John Schamel, "How the Pilot's Checklist Came About," Flight Service History, 2012, http://www.atchistory.org/History/checklst.htm

[56] Boyne, "The Checklist," 55.

[57] Ibid., 56.

incidents have consistently stressed the importance of the relationship between good teamwork in the cockpit and safety."[58]

Grote et al. suggested that while checklists proved to be a sound tool for task capture and redundancy, it did not address the human dynamic of teamwork, communication, and discipline.[59] Consequently, as airline travel became more ubiquitous, the rate of accidents in the 1960s, 70s, and 80s began to reach a critical juncture. The result was an industry wide embrace of the concept of CRM. Gordon and her colleagues speak to the incidents that finally resulted in the full scale change:

> During the airline industry transition to the jet age in the 1960s and 1970s, a series of disastrous crashes took place: among them, two planes colliding in Tenerife, Canary Islands; a controlled flight into terrain (CFIT)—straight into the Florida Everglades; and a perfectly airworthy craft simply running out of fuel and crashing near Portland, Oregon. In response, CRM began in the early 1980s.[60]

## E.   LITERATURE ON HOW COMPONENTS OF AVIATION SAFETY ARE TAUGHT TO PILOTS

One component of aviation safety noted in the literature is that of discipline or airmanship. Nergard and his colleagues explain, "To learn the knowledge of flying an aircraft is intimately interwoven with learning airmanship. Airmanship is a type of awareness, a knowledge pilots must adopt to in order to become and be appreciated as a pilot."[61]

Aviation instructors have developed a specific method for teaching the art of airmanship. Ebbage and Spencer provide a synopsis of how airmanship is both trained and evaluated on. Overall, they review a four-step process, which includes introducing the concept of airmanship, the overall teaching strategies, teaching the foundations of

[58] G. Grote et al., "Adaptive Coordination and Heedfulness Make Better Cockpit Crews," *Ergonomics* 53, no. 2 (2010): 211.

[59] Ibid.

[60] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 178–81.

[61] Vegard Nergård et al., "An Airman's Personal Attitude: Pilots' Point of View," *Aviation* 15, no. 4 (2011): 107.

airmanship, and assessing airmanship.[62] While each of these steps are comprehensive and often continue throughout a career, a brief summary of each is as follows:

1. **Introducing the concept of airmanship:** this initial stage of airmanship training consists of providing new pilots with real-world examples of where poor airmanship has caused a crash and examples where model airmanship has saved lives. The importance of airmanship, in addition to flying skills alone, is stressed.[63]

2. **Overall teaching strategies:** in general, this section includes the basic flying instruction courses taught to all pilots. Quality flying skills are absolutely necessary to being a good airman. Throughout this process though, the benefits of airmanship are continuously stressed.[64]

3. **Teaching the foundations of airmanship:** in this section, the aviator is provided intensive airmanship training. Each foundation of airmanship— knowledge, skills and attitudes—are taught. Within each of those foundations, specific tasks and principles must be attained and maintained to ensure airmanship. Those foundations and the skills are noted in the Table 1.[65]

4. **Assessing Airmanship:** this section is where the continuous practice of assessment and review comes into play. All aviators are constantly being evaluated and assessed, both by others and of themselves, to look for improvement opportunities. The cycle of teaching and assessment will continue throughout an aviators career.[66]

---

[62] Louise Ebbage, and Phil D. Spencer, *Airmanship Training for Modern Aircrew* (Bristol, UK: BAE Systems, 2004), http://www.dtic mil/cgi-bin/GetTRDoc?AD=ADA428471, 7.

[63] Ibid.

[64] Ibid., 8.

[65] Ibid., 6.

[66] Ibid., 10.

Table 1.    The Knowledge, Skills and Attitudes that are the Foundations of Airmanship[67]

| THE FOUNDATIONS OF AIRMANSHIP | | |
| --- | --- | --- |
| **KNOWLEDGE** | **SKILLS** | **ATTITUDES** |
| **Knowledge of aircraft**<br>- Deep understanding of aircraft sub-systems, emergency procedures, cockpit automation, aircraft flight characteristics and operating limits. | **Physical skills**<br>- Flying skills<br>- Navigation skills<br>- Instrument flying<br>- Emergency handling / recovery<br>- Combat survival | **Hazardous attitudes**<br>- Understanding the five main hazardous attitudes, the antidotes and the impact on airmanship (see Table 2) |
| **Knowledge of environment**<br>- Understanding the physical environment and the effects on aircraft control.<br>- Understanding the regulatory environment.<br>- Understanding the organisational environment and the challenges posed to airmanship. | **Cockpit management skills**<br>- Avoiding the pitfalls of automation (over-reliance, complacency, bias)<br>- Information management skills | **Professionalism**<br>- Understanding the values and principles embodied in airmanship. |
| | **Communication Skills**<br>- Vigilance in monitoring communications<br>- Using appropriate communication (phraseology, clear, concise)<br>- Active listening<br>- Inquiry through communications | **Self-improvement**<br>- Developing the motivation needed for life-long learning<br>- Understanding the requirement for self-assessment in flight.<br>- Developing the will to achieve performance excellence |
| **Knowledge of risk**<br>- Understanding the risks to discipline, skill and proficiency, knowledge, SA, judgement, aircraft, self. | **Cognitive skills**<br>- Understanding and maintaining situational awareness<br>- Problem solving / decision-making skills<br>- Understanding and managing workload<br>- Self-assessment | **Discipline**<br>Discipline in terms of:<br>- flight preparation<br>- flight discipline (e.g. vigilance/ look-out, SA maintenance, operational & regulatory policy)<br>- knowledge & skills maintenance<br>- post-flight evaluation<br>- self-discipline (managing stress, managing attitudes) |
| | **Team skills**<br>- Performance monitoring<br>- Leadership / initiative<br>- Interpersonal skills<br>- Co-ordination & decision-making<br>- Team communication and SA | |

## F.    MOVING FORWARD

The literature pertaining to the 9-11 attacks, NIMS, ICS, police-fire divides, and the early development of aviation safety practices provides a base of knowledge with which to continue the argument of this thesis. The divide between the agencies as it relates to managing a complex emergency under the guise of NIMS and ICS principles is a challenge.

---

[67] Ibid.

Chapter III will provide analysis of CRM principles, including the introduction, team intelligence, and the pre-flight briefing. These three principles ensure that interagency conflict is kept to a minimum, thereby achieving a high degree of safety and efficiency. Chapter III will then apply the benefits each of those principles can have should they be embraced by police and fire agencies.

# III.   PRE-FLIGHT

Pre-flight safety procedures in aviation are arguably the most important components of the industry. It is the pre-flight where all details planning and implementation of the pending event are specifically mapped out. This process spans

> the local team (i.e., among flight crew members) and the more global team (i.e., between flight crew and other flight operations functions such as safety, flight operations control and duty manager, flight planning, dispatch, maintenance, cabin crew, and ground handling).[68]

The various processes necessary in preparation of takeoff are also analogous to an emergency responder preparation for a shift. For example, a paramedic inspects equipment, checks that drugs are available and not expired, insures the ambulance is road worthy, verifies operational communication equipment, and checks in with dispatch. Most importantly, if working with a new partner, that paramedics will likely pre-plan their actions on different emergencies that may arise later in the shift. For example, they plan to immediately transport a traumatically injured patient to the hospital but manage a medical cardiac arrest in the home to improve the chance for survival. Similarly, a police officer conducts a pre-flight process before heading out on the road for a shift: vehicle worthiness, communications, personal protection, weapons inspection, etc.

The difference between the emergency pre-flight and aviation is twofold. First, pre-flight activity in aviation is a regimented and universal process that must be followed. Aviators and staff must implement specific tasks per protocol every time, without fail.

Second, the aviation industry requires the direct inclusion of all members, from ground crew to air traffic control to pilots, in the collaborative pre-flight process. By contrast, the pre shift check of a police officer, paramedic, or firefighter can vary drastically—department to department, shift to shift, person to person. For example the ambulance paramedic may not speak directly with the fire engine crews to pre-plan emergency operations for the day. Almost certainly, that fire engine lieutenant and that

---

[68] Joan Cahill, Nick McDonald, and Gabriel Losa, "Understanding and Improving Flight Crew Performance of the Preflight, Flight Planning, and Briefing Task," *The International Journal of Aviation Psychology* 23, no. 1 (2013): 44.

police officer are not holding a briefing with one another to prepare for potential interaction later in the shift.

Chapter III will assess the core component of aviation success in safety and productivity: crew resource management (CRM). Chief amongst those pre-flight CRM principles are the introduction, team intelligence, and the briefing.

## A.    CREW RESOURCE MANAGEMENT

As noted in the literature review, CRM principles were necessitated by crashes in the 1960s, 70s and early 80s that stemmed largely from a failure in human relations. CRM, to a large extent, is the umbrella to which all other aviation principles are covered. While the Ohio crash of the model 299 in 1935 instituted the memory aid of the checklist, CRM is the tool that oversees the human dynamic that is constantly at play in, on, and around an airplane. According to Prabhakar,

> The development of Cockpit [now Crew] Resource Management, therefore, had the goal of reducing 'pilot errors' by improving cockpit crew's utilization of available human resources on the flightdeck. Specifically, Cockpit Resource Management was defined as a 'management system that makes optimum use of all available resources, equipment, procedures, and people to promote safety and efficiency'[69]

Broadly, the components of CRM focus largely on the following eight core factors:

1.    Making introductions and setting the stage for teamwork

2.    Conducting appropriate briefings

3.    Creating/reaffirming a shared language

4.    Establishing mutual understanding of decisions about operations

5.    Inviting participation

6.    Seeking information and direction from others when necessary

7.    Promoting appropriate assertiveness to maintain safe operations

8.    Examining self and group, including critiquing as appropriate[70]

---

[69] Hari Prabhakar, "Translation of Aviation Safety Principles to Patient Safety in Surgery," in *Patient Safety in Surgery*, ed. Philip F. Stahel, and Cyril Mauffrey (New York: Springer, 2014), 221.

[70] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 1178.

While each of these core factors are essential to CRM in the aviation industry, those that can be directly applied to the emergency services—introductions, teamwork, and briefings—will be discussed at length.

## B.   MAKING INTRODUCTIONS

On its face, a handshake and introducing oneself by first name seems intrinsic, even trite. One might argue, "I don't have time to introduce myself and play nice. This is a life or death profession, not a party." Quite to the contrary though, CRM research and teachings suggest that something as simple as a handshake and introduction by first name in the pre-flight stage can profoundly improve one's ability to operate in an emergency. Furthemore, the research shows that an introduction should be the first action conducted when a team comes together for a briefing, whether they know one another or not.

Because they enhance safety, introductions play a key role in CRM communications and team building. The airline industry long ago figured out what brain science is now documenting:

> Although we are constantly admonished not to judge a book by its cover, the human brain works by doing precisely that. With huge amounts of information to process, to get through the day our brains continually take shortcuts. One of those involves reacting immediately to initial signals. If the captain sends out the kinds of signals the 'bad captain' broadcast loud and clear, the immediate gut response will be to feel intimidated or antagonized, and the brain will be on alert to look out for this guy.[71]

Something as simple as a hand shake and an introduction has the power to disarm those snap judgment tendencies and open the mind to appreciating other qualities in a colleague. As a result:

> Any crew briefing [in aviation] will start off with introductions. The importance of introductions cannot be overstated: research has indicated conclusively that the act of simply exchanging names has a measurable positive impact on team building and communication (and interestingly, also on job satisfaction).[72]

---

[71]Ibid., Kindle location 1226.

[72] Ibid., Kindle location 1197–99.

31

Atul Gawande provides a direct example of the dynamic between Captain Chesley Sullenberger and his first officer Jeffery Skiles:

> the first thing to note is that the two had never flown together before that trip. Both were tremendously experienced. Skiles had nearly as many flight hours as Sullenberger and had been a longtime Boeing 737 captain until downsizing had forced him into the right-hand seat and retraining to fly A320s.[73]

In addition, Gawande speaks to the fact that having such depth of experience in Sullenberger and Skiles in the cockpit should be a benefit on the surface:

> This much experience may sound like a good thing, but it isn't necessarily. Imagine two experienced but unacquainted lawyers meeting to handle your case on your opening day in court. Or imagine two top basketball coaches who are complete strangers stepping onto the parquet to lead a team in a championship game. Things could go fine, but it is more likely that they will go badly.[74]

Now, think of a fire battalion chief with 30 years of experience managing structure fires. She has a deep knowledge of the tasks, tactics, and strategy that are required to manage a house fire. She knows, for example, that two firefighters must complete the task of removing the hose from the fire engine and advancing toward the fire while two others take a ladder to the roof for ventilation. At the same time, she understands the tactics that are required for both of those crews to coordinate those advancing and ventilation tasks for best effect on the fire. Finally, she is likely and expert in the global strategy for implementing those tactics to affect the overall priorities of life safety, incident stabilization, and property conservation.

Similarly, a police captain too, understands the intricacies of the tasks, tactics, and strategies of a police incident. He understands that police officers arriving to a violent scene will immediately engage in the task of stopping the violence. Additionally, he knows that the first arriving sergeant should begin to organize the tactical objective of setting a perimeter around the incident. As the highest ranking officer on the scene, that

---

[73] Atul Gawande, *The Checklist Manifesto: How to Get Things Right* (New York: Metropolitan Books, 2010), Kindle location 2210–12.

[74] Ibid., Kindle location 2212–14.

captain has a sound knowledge of the need to strategically manage the overall priorities of life safety, incident stabilization, property conservation, and crime scene management.

While that battalion chief and police captain are in different professions, they still have the same objectives on any police-fire combined event. Thomas Creamer elaborates on those objectives:

> careful study of incident priorities for all first response agencies clearly indicates their priorities are rarely as much at odds as the individual response agencies themselves. The objectives of life safety, incident stabilization, property conservation, and crime scene management have been with us for years. So why the confusion? In reality, are not all of our priorities mutually shared? Do we not all aspire to save lives, stabilize the incident, and find those responsible so that we can ensure it doesn't happen again?[75]

Just like those lawyers or basketball coaches, who may have completely different approaches, police and fire are still in the same courtroom and on the same court. In order to carry out that shared goal as a unified team, employing the practice of introductions may prove beneficial prior to the emergency starting.

### 1. Why the Need for Introductions

Zijlstra, Waller, and Phillips note logistically,

> the need for introductions in CRM training came to light out of the fact that "members of flight crews working for commercial airlines are often scheduled to work together as strangers, only becoming acquainted on their first meeting on the flight deck or in the flight preparation room."[76]

Captain de Crespigny also speaks to the fact that flight crews often do not know one another:

> The night before [the QF32 flight], I'd phoned my flight crew—Matt Hicks (first officer) and Mark Johnson (second officer)—and said I looked forward to meeting them in the lobby of the hotel at 8.30 am. I'm not a stickler for hierarchy, but since captains fly with so many different crews

---

[75] Creamer, "Multiagency Response to WMD," 1.

[76] Fred R. H. Zijlstra, Mary J. Waller, and Sybil I. Phillips, "Setting the Tone: Early Interaction Patterns in Swift-Starting Teams as a Predictor of Effectiveness," *European Journal of Work and Organizational Psychology* 21, no. 5 (2012): 758.

it's important to the team dynamics that the captain be proactive. I like to set a happy and relaxed tone when we meet for the first time before we travel to the airport or take our places in the cockpit. This is not about ego; it's about organizing people who hold great responsibility on their shoulders to quickly get focused into their roles within the team… I knew Matt because I'd flown on A330s with him in the past, but I had never met Mark before. We introduced ourselves…[77]

The reality of crew members not knowing one another is commonplace within the aviation industry.

The breadth and diversity of personnel in aviation is akin to that of police and fire departments. While the makeup of the thousands of fire and law enforcement agencies across the country is diverse, most urban and suburban agencies are large enough where knowing every member of each department is logistically infeasible. Moreover, given the fact that police and fire departments are separate agencies, a silo effect is easily a reality between the two.

Michael Fahy speaks to that silo effect: "although often spoken of collectively as 'first responders,' some might be surprised to know how little personal interaction police officers and firefighters have..."[78] In addition, Fahy cites three examples of why consistent interaction between the agencies proves challenging:

1. The consistent movement of individuals from both entities due to promotion and personnel transfers does not allow for consistent interaction.

2. Hiring and retirement of personnel furthers the mixing of individuals within jurisdictions.

3. Schedules of the respective agencies vary greatly. This does not allow individuals from police and fire agencies to interact on a consistent basis.[79]

As a consequence, the probability of a police and fire commander knowing their counterpart—or having worked a complex emergency together—when arriving to the scene is low. Thus, like aviation, introductions between those battalion chiefs or captains

---

[77] de Crespigny, *Qf32*, Kindle location 1556–71.

[78] Michael J. Fahy, "Understanding 'Swift Trust' to Improve Interagency Collaboration in New York City" (master's thesis, Naval Postgraduate School, 2012), 41–42.

[79] Ibid.

during the pre-shift preparation phase is beneficial. Their "pre-flight" introduction will improve the relationship dynamic between that unified command team when they are strategically responsible for a life safety event later in that shift.

### 2.    The Structure for Facilitating Introductions

Specific procedures have been developed to engrain the practice of introductions into the culture of the aviation industry. Many of those practices take place in the briefing portion of the pre-flight phase—a topic that will be discussed at length later in the chapter.

The specific techniques employed to insure those introductions are comprehensive. For example, training all aviation staff in the classroom stresses that process:

> introductions are so important to the coming together and effective functioning of a team that considerable time is spent training people in communicating such apparently simple information as name, title, and rank. Perhaps even more important than the specifics of the information are the other cues that communicate so much about what individuals may expect their team relationship to be: tone of voice, self-presentation and demeanor, eye contact and other body language.[80]

Those teachings then transfer to the pre-flight briefing where policy dictates that introductions be made. One example of this policy is provided by Cahill and her colleagues:

> The workflow is as follows. First, the crew meet. If the crew do not know each other, there might or might not be preliminary introductions. Following this, there is a summary review of the flight plan, weather, aircraft technical status, and crew expectations. The official briefing then commences.[81]

Patrick Mendenhall, a prominent A330 pilot and authority on CRM, provides his procedure for introductions:

---

[80] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 1203–07.

[81] Cahill, McDonald, and Losa, "Understanding and Improving Flight Crew Performance," 34.

We all know the full names of the other crew members from the 'Crew Orders' briefing sheet. Then at the actual briefing we go around the room and make introductions by first names. It seems like a small thing, but when you start out with the crew knowing each other on a first-name basis, it really improves 'approachability' for everyone.[82]

The same principle of introductions between police and fire during a pre-flight/pre-shift briefing could facilitate similar benefits. That introduction during the pre-shift meeting would then assist in cultivating teamwork among those participating in the briefing.

## C.    TEAMWORK

Flying and aircraft from Denver to San Francisco takes the combined efforts of administration, maintenance, ground, air traffic control, flight attendant, and cockpit personnel. In short, it takes a team—often one that forms and disbands with relative frequency. Formally, that team can be described as

a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common goal/objective/mission, who have each been assigned specific roles or functions to perform, and who have a limited life-span of membership.[83]

In aviation, like emergency response, the value of an efficient team dynamic between commanders can literally be the difference between life or death. A cockpit flight crew and a police officer and firefighter in a unified command, while small, are still forming a team together. This team is more of a relationship based interaction, but a team nonetheless.

### 1.    How Teams Form

As assessed in the introduction section of Chapter III, "flight crews in airlines are constantly formed and disbanded by rostering systems designed to meet a tangled array of logistical demands and events, and crew members are expected to effectively fly together immediately after meeting each other."[84] Similarly, police and fire officers are

---

[82] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 1199–203.

[83] Zijlstra, Waller, and Phillips, "Setting the Tone," 758.

[84] Ibid., 750.

expected to work well with one another at a unified command post—like a cockpit—soon after meeting one another. These teams are formed quickly,

> based on who happens to be on shift or assigned to duty at the time and place of team formation. As a result, teams with low levels of familiarity are quickly formed to address critical, time-pressured situations with no time to explore personal similarities and differences, or to settle into familiar roles and go through the team development processes.[85]

This particular action is known as swift-starting teams.

Though true in aviation, swift-starting teams prove even more corollary to the police-fire-combined emergency because "swift-starting teams…are newly formed, ad hoc teams composed of highly trained individuals who must engage in the immediate interdependent performance of complex tasks."[86] As noted earlier, a fire battalion chief and a police captain are highly trained individuals who must form an ad hoc unified command to strategically coordinate the tactics and tasks of their respective departments.

> Furthermore, both aviation and emergency response teams, in general, involve
>
> members who are competent and familiar with their complex work environments, teams working quickly under situations of very evident time pressure, stable roles but ad hoc team membership, and complex, interdependent tasks that rely on team members' interactions during the performance and coordinated execution of well-trained skills.[87]

Each of those components are critical tasks and tactics that must be implemented in order for life safety, incident stabilization, property conservation, and crime scene management to occur. It is in the strategic—commander—realm where trust becomes truly critical in swift-starting teams.

### 2.    Need for Trust in a Team

Trust at the strategic level requires that the police and fire commanders cultivate a level of team intelligence with one another. Team intelligence is "the active capacity of individual members of a team to learn, teach, communicate, reason, and think together,

---

[85] Ibid.

[86] Ibid., 751.

[87] Ibid.

irrespective of position in any hierarchy, in the service of realizing shared goals and a shared mission."[88]

Crew resource management dictates that team intelligence must adhere to the following four components:

1. Team members must develop a shared team identity that allows them to articulate the shared mental model, shared language, and shared assumptions needed to realize their clear and common goals.

2. Team members must be willing and able to share information, cross-monitor, and coach all members of the team, as well as to solicit and take into account their input, no matter their position in the occupational hierarchy.

3. Team members must understand one another's roles and work imperatives and how these mesh so that common goals can best be accomplished.

4. Team members must help and support one another so that each individual member can perform his or her job efficiently and effectively.[89]

Fred Zijilstra and his colleagues suggest in their article, "Setting the Tone: Early Interaction Patterns in Swift-Starting Teams as a Predictor of Effectiveness:"

> that the initial moments of team development prior to work activities are extremely important to subsequent team outcomes. In this period, teams normally develop and build the trust that helps communication patterns involved in exchanging and sharing information, which are crucial for team performance.[90]

Within the cockpit, those initial moments of trust and team development can manifest in many different ways. Fred George provides an assessment of how Captain de Crespigny incorporates team intelligence and trust into his cockpit in his article "Qantas Flight 32:"

> Effective use of command authority is the other main pillar upon which effective captains stand. He [Captain de Crespigny] says they have to 'level the command gradient,' make the most junior crew member believe his participation is vital to the outcome of the mission. 'Our junior pilot on Flight 32 caught a fuel imbalance that could have caused controllability problems,' de Crespigny recalled. A level command gradient also means

---

[88] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 365.

[89] Ibid., 751.

[90] Zijlstra, Waller, and Phillips, "Setting the Tone," 750.

that senior pilots must control their influence, yielding authority to the aircraft's pilot-in-command. Leave your ego on the ground. You have to be humble enough to involve everybody. Much of the leveling occurs during social debriefs…You can't do it alone anymore in the cockpit. You have to have a great crew." He also says dealing with the unexpected takes courage and confidence. The enemy is complacency.[91]

During the pre-shift briefing between police and fire commanders, who will be responding together later in the shift, team development is important. Those commanders may be widely apart in terms of rank and authority. Establishing and understanding a level command gradient between the two ahead of time can help alleviate confusion or concerns during the complex emergency later in the shift.

## D. BRIEFING

When correlating the principles of the aviation industry and what it can lend to emergency response, the practice of the briefing is one of the most cited factors for success in the literature. The pre-flight briefing is the mechanism whereby many crew resource management principles are put into place. Consequently, in depth analysis of the briefing process aids in assessing the corollary benefits to the police and fire combined response.

### 1. Why Conduct a Briefing

Conducting a pre-flight briefing has become as important and second nature as the use of the checklist in the cockpit. Cahill and her colleagues speak to that importance:

> The preflight briefing is critical from a safety and human factors and an operational perspective. From a safety perspective, this task plays a key role in terms of ensuring that the crew identify, discuss, and manage the complexities and risks associated with the upcoming flight. It is also essential in terms of cementing team concepts, supporting team situation awareness, and managing workload. The briefing task is also important from an operational perspective. The signoff of the flight plan is a vital step in the operational process. Moreover, this task functions as a key interface between the management of the process by the flight crew and the wider management of the process by other operational stakeholders or

---

[91] Fred George, "Qantas Flight 32," *Business & Commercial Aviation* 109, no. 2 (2013): 46.

functions (i.e., coordinator, dispatch, flight operations control, safety, and maintenance).[92]

They further detail:

As part of the preflight, flight planning, and briefing task, flight crew collaborate with a range of agents involved in similar and different processes, to obtain information necessary to the assessment of the flight situation and the associated management of complexity. In this way, the preflight, flight planning, and briefing task functions as a key interface between the management of the process by flight crew, and the wider management of the process by flight operations control or the duty manager."[93]

Like the operational stakeholders who are integral to successful emergency response (e.g., 911 call takers, dispatch, maintenance, IT, police and fire responders) aviation professionals utilize the briefing as the conduit for all of their stakeholders to obtain and maintain up-to-date situational awareness. By incorporating CRM principles into the formal and regimented process of a briefing, each of those stakeholders gain that explicit situational awareness. According to Cahill, McDonald, and Losa:

Specifically, [CRM] confers sense on [the] role of [the] briefing in terms of fostering teamwork and supporting the development of a common situation picture. As defined, formal briefings involve the joint review of information, joint situation assessment, and joint decision making in relation to flight decisions. Briefing provides a formal and regimented process.[94]

The facilitation of joint interaction and joint decision making is what makes aviation so successful. Joint interaction and decision making in emergency response is lacking, and first responders could benefit from the lessons of the aviation world.

The briefing serves a logistical role for tasks that need to be accomplished for a specific flight segment. More importantly though, "the underlying goal is to cement team concepts and facilitate joint situation assessment and decision making."[95] One captain in

---

[92] Cahill, McDonald, and Losa, "Understanding and Improving Flight Crew Performance," 27–28.

[93] Ibid., 40.

[94] Ibid., 29.

[95] Ibid., 38.

the Cahill study noted, "A good quality briefing ensures that the crew are aware of all risks and equipped to manage these, if they arise later in the operation."[96] Cahill, McDonald, and Losa caution, "The nature and tone of this first briefing dictates the nature and tone of these other briefings."[97] They also note the benefits of a briefing, "If the crew are well briefed at this early stage, then it is more likely that they will be able to manage the increase in workload associated with changes to the flight plan."[98]

The principle of having a well briefed aviation crew correlates directly to the police and fire response dynamic. For example, a police captain may prefer to speak directly with her tactical level police supervisors on a complex emergency before making a face-to-face contact with the fire side. It would thus be important to pass this preference along to the fire commander during a pre-flight briefing of his own: that way the fire commander knows the probable actions of the police commander in the initial moment of a complex event. Similarly, a fire battalion chief may plan to utilize his chief vehicle as the command post for an incident. It would thus be beneficial for that battalion chief to clarify this plan during a pre-flight briefing so the police commander knows that she will need to meet at the battalion chief vehicle to establish face-to-face contact.

## 2. The Briefing Process

Like the regimented use of checklists, the pre-flight briefing is a standardized and highly ordered process. While the briefing holds such a high degree of importance in the pre-flight briefing, the task of actually conducting them has been designed to be as painless as possible. Gordon, Mendenhall, and O'Connor argue:

> Briefings, as the word implies, should be brief. By definition this should not be a ten-minute dissertation. In CRM training, captains learn how to give pertinent information briefly, and the rest of the crew learns how to similarly exchange important points.[99]

---

[96] Ibid.

[97] Ibid.

[98] Ibid., 38–39.

[99] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 1278–80.

The process of conducting the briefing constitutes a large portion of the CRM training process provided by airline companies. As Gordon and her colleagues assert, "none of this comes naturally. Conducting communicative conversations—not just critical ones in times of conflict, disagreement, or stress—is a proficiency-based skill that gets better with practice."[100]

Through training and practice, the briefing has become second nature to all aviation crews. It is easy and quick to conduct and vastly improves the relationship, team intelligence, and operational preparation of each member of the flight environment. It is that ease with which the aviation community conducts this type of briefing that lends credence to the fact that a similar concept could be implemented in the preparation by police and fire officials.

### 3.      Requirements for a Good Briefing

Simply mandating that a group conduct a briefing in a specific manner will not necessarily insure that said briefing is a successful and productive one. As assessed previously, many factors such as culture, time, and team dynamics can lead to unproductive—even counterproductive—briefings. Cahill, McDonald, and Losa relate:

> Several human factors dimensions pertaining to the status of the crew and crew relations that affect the crew's disposition to perform a briefing or their perception of the requirement to brief include: the crew might be meeting for the first time, the crew might have different training and experience backgrounds, one or both of the crew members might not be open to CRM concepts and briefing, the crew might be fatigued, one of the crew members might be returning to work after a period of holiday or sick leave, the crew might or might not be familiar with the route (i.e., they might not have flown it before), or one of the crew members might have minimal experience flying the specific aircraft type (i.e., just joined the fleet).[101]

One could extrapolate many of the same factors that Cahill identifies for police and fire officers. Similar to the above quote, barriers to police and fire working well together can include: the respective commanders have never met before, commanders

---

[100] Ibid., Kindle location 1280–82.

[101] Cahill, McDonald, and Losa, "Understanding and Improving Flight Crew Performance," 37.

having distinctly different training and experience in their respective fields, one or both may not be open to the concept of a briefing and the CRM practices precipitating it, both commanders are fatigued as a result of being a part of a busy department, or the commanders may have a lack of experience in a complex emergency environment.[102]

CRM principles have coping mechanisms for such barriers to entry. The requirements for a good briefing as discussed by Cahill and colleagues are well established and provide a direct counter too many barriers. There are six categories to ensure a good briefing (task functions, procedures, tools and information, process design, human factors and social processes, and training). Each of these briefing factors will be discussed in relation to how aviation does it, and what police and fire departments can learn from it.

### a. Category 1: Task Functions

According to Cahill, McDonald, and Losa:

> A good briefing achieves several related task functions, including establishment of the team concept, the assignment of flight roles, the assessment of the risk status of the operation (including the addition of threat information not recorded in the system), the review of all relevant flight information (i.e., routing, weather, crew, aircraft technical status, fuel, load, and [Notice to Airmen Statements] (NOTAMS)).[103]

Police and fire agencies can utilize task functions to ensure their own good briefing. During a pre-shift briefing between police and fire commanders, many of the following tasks can be identified and confirmed. Radio logistics, for example, can be addressed in the briefing. This includes which channels fire is expected to use when coordinating with police and what call signs to use.

Another task that can be conducted in the briefing is a quick review of when it is required to establish a unified command. A police initiated medical call for example, may not require fully establishing a unified command because each agency won't need to actively engage in operations at the same time. By contrast, an active domestic violence

---

[102] Ibid.

[103] Ibid., 43.

incident would constitute a requirement for both commanders to establish a unified command with one another.

Finally, tasks identified in the pre-shift briefing could include weather forecasts, special events, suspicious activity or other out-of-the-ordinary factors.

### b.    *Category 2: Procedures*

Cahill, McDonald, and Losa explain:

> Clearly defined procedures are a prerequisite for a good briefing. The role of both the captain and the first officer in relation to the performance of the briefing task must be clearly defined. This includes the procedure for initiating the briefing, the level of teamwork required, and the nature and scope of decision making. The particular process for analyzing flight threats and identifying threat management strategies must be defined. Procedures must make clear the criteria for requesting extra fuel and the process for this. Flight crew collaboration requirements with other agents must be specified. Operational changes and information updates must be communicated in a timely fashion to crew members, so that they have the opportunity to review these changes and conduct a rebriefing if required.[104]

Police and fire agencies can use specific procedures to ensure their own good briefing. Once the tasks have been identified that specify when a unified command must be implemented the procedure for implementing that face-to-face contact should be briefed.

One such procedure could include how a fire lieutenant should initiate radio communications with a police officer at the scene. The police commander conducting the briefing might state:

> When my officers are inside a house where there is still a potential for hostile activity, we will likely institute radio silence for all police on that channel. This ensures that the officer inside that residence has immediate access to dispatch and his fellow officers, via the radio, in case he finds himself in danger. If you are responding to this scene and call me on the radio to set up a unified command while my officer needs to make a distress call he may not get out on that radio channel because we are talking. So, before contacting any officer directly, I need you to come on

---

[104] Ibid.

the air and ask the dispatcher: 'dispatch engine 1, is the air clear?' If they answer back 'yes', then feel free to continue the communication 'cruiser 24, this is engine 1, we are approaching the scene, where would you like to meet for a face to face?' This is the procedure we will follow today. Are there any questions about that?[105]

Failure to acknowledge this procedure in a pre-flight briefing between police and fire could result in undue injury to police officers—not to mention the breakdown in trust between the agencies.

### c.        Category 3: Tools and Information

Cahill, McDonald, and Losa note:

The pre-flight briefing in aviation stresses the importance of having all tools and information in hand prior to the start of that briefing. Those crew need to have the most up to date weather forecasts, threats, routing information, etc. in hand so the briefing can be conducted with the best data available.[106]

While the tools and information available to aviation professionals is required, so too is such information for police and fire crews. Weather forecast, staffing, ambulance availability, call volume, special events, etc. are all critical pieces of information needed to conduct an effective briefing.

### d.        Category 4: Process design

Cahill McDonald, and Losa suggest:

The process must be designed to allow for the communication of the right information to the flight crew at the right time. This requires the specification of relevant safety feedback loops to (a) flight planning to support an intelligent flight planning process, and to (b) flight crew, to facilitate relevant briefing task functions. The flight crew must have sufficient time to perform a comprehensive review of all flight information to make any decisions relating to [Air Traffic Control] (ATC) and routing changes.[107]

---

[105] Fictitious quote designed to reinforce the objective of category.

[106] Cahill, McDonald, and Losa, "Understanding and Improving Flight Crew Performance," 43.

[107] Ibid., 44.

The process design for ensuring effective briefings and collaboration between police and fire is also important. Many of the important tools and information that need to be included into the briefing would need to be disseminated to the right people such that there is sufficient time to pass the information along and entertain the implications in the briefing.

### e. Category 5: Human Factors and Social Process

Cahill, McDonald, and Losa further state:

> In keeping with CRM frameworks, teamwork underpins a successful briefing. This teamwork spans the local team (i.e., among flight crew members) and the more global team (i.e., between flight crew and other flight operations functions such as safety, flight operations control and duty manager, flight planning, dispatch, maintenance, cabin crew, and ground handling). Further, both crew members must be disposed to CRM concepts in terms of appreciating the benefits of making a complete briefing. Also, both crew members must be motivated to make a complete briefing at the preflight stage.[108]

Including all strategic level members of the first responder community into the pre-shift briefing process is core to its success. The primary goal of the briefing is to facilitate a strategic plan of attack for an incident that may take place later in the shift. Unique to the incident command system in particular is the fact that the first person to arrive to that incident is in charge of that incident until relieved by someone. Consequently, a fire engine arriving to the scene of a domestic violence incident will be in charge of the strategic requirements until relieved by a battalion chief. Thus, it is just as important for a lieutenant and his or her crew to participate in the briefing as it is for the battalion chief: both are expected to follow the same tasks and procedures at the outset of a complex emergency. Additionally, every police officer and firefighter participating in the briefing must be willing to embrace the culture shift that will result from appreciating the aviation CRM/briefing model.

---

[108] Ibid.

*f.*    *Category 6: Training*

Regarding training, Cahill, McDonald, and Losa suggest:

The flight crew must have received adequate training in relation to the key role of this task in terms of delivering on both operational and safety objectives. Further, both crew members should understand the requirements for a good briefing following from the analysis and application of CRM theory in crew CRM training sessions.[109]

Aviation and emergency response agencies both take training seriously. The incorporation of a pre-shift briefing regimen into daily activities for police and fire would be a departure from the norm. The very nature of the joint briefing will require that training for this and other CRM principles be conducted jointly as well. This type of training will need to be facilitated via three different components.

*Component 1*: Administrative and chief level trainings between police and fire officer is necessary. Not only is buy-in needed from these department decision makers, they will need to be able to conduct, participate in, and train the rest of their departments on these procedures.

*Component 2*: Line level sergeants, lieutenants, and captains on the police and fire side need to be trained in the five categories of a good briefing (as noted previously). When these individuals are proficient in this process, they can impart the importance of those briefings on their subordinates.

*Component 3*: Joint training between the entry level recruits and cadets at training academies is needed. Building the relationships between these new hires will help to facilitate the needed culture shift as attrition continues from retirements. This is not to say that police and fire academies should be run jointly: each are very different professions and should remain separate. However, instituting new trainings where both cadets and recruits engage in complex unified command initiated tasks is very important. For example, high risk extraction activities practiced in live scenarios could be part of a joint class.

---

[109] Ibid.

## E.    ANALYSIS

Chapter III delves into the CRM principles of the introduction, team intelligence, and the briefing. Formal introductions during the pre-flight stage are a critical factor for success. Cultivation and facilitation of teamwork once people are introduced in that pre-flight stage is also important. Each of those concepts are wholly dependent on one another. It is the briefing though that takes the benefits of CRM and puts them into practice.

Complex emergencies require that police and fire agencies immediately engage in their specific tasks, tactics, and strategies at the same time and in the same geographic space. The individuals commanding that incident must work cohesively as a team in order to organize the movements of their agencies in that theater. If those commanders have set aside time earlier in the shift to establish a relationship and dictate a specific plan for each to follow in the event of a complex emergency later in the shift, they will be much better prepared.

One may argue that the likelihood of a Virginia Tech shooting happening in their joint jurisdiction is minimal: thus, the need for joint pre-shift briefings is not necessary. That argument can easily be made within aviation as well. Given the fact that the pre-flight briefing process was conducted over 30.5 million times in 2010,[110] one would surmise that the monotony of such a task would lead it to be skipped by certain experienced crews. Overcoming the monotony of such a task—insuring every crew has the discipline to conduct the briefing—is where aviation has truly succeeded however. In assessing the events of the U.S. Airways flight 1549 landing in the Hudson, Atul Gawande provides an example of such success:

> Before the pilots started the plane's engines at the gate, however, they adhered to a strict discipline—the kind most other professions avoid. They ran through their checklists. They made sure they'd introduced themselves to each other and the cabin crew. They did a short briefing, discussing the plan for the flight, potential concerns, and how they'd handle troubles if they ran into them. And by adhering to this discipline—by taking just

---

[110] Jeffrey Kluger, "Fear of Flying: Don't Be Fooled by the Scary News—Air Travel Is as Safe as Ever," *Time Magazine*, July 24, 2014.

those few short minutes—they not only made sure the plane was fit to travel but also transformed themselves from individuals into a team, one systematically prepared to handle whatever came their way.[111]

Gawande continues:

I don't think we recognize how easy it would have been for Sullenberger and Skiles to have blown off those preparations, to have cut corners that day. The crew had more than 150 total years of flight experience—150 years of running their checklists over and over and over, practicing them in simulators, studying the annual updates. The routine can seem pointless most of the time. Not once had any of them been in an airplane accident. They fully expected to complete their careers without experiencing one, either. They considered the odds of anything going wrong extremely low, far lower than we do in medicine or investment or legal practice or other fields. But they ran through their checks anyway.[112]

While complications on an airline are rare, a complex emergency does not just manifest in the form of a terrorist attack or active shooter. Complex emergencies take place every day. Any time police are responding to a hostile situation with an injured person, there is a need for both police and fire to get into that scene and do their job at the same time. In order to do their job, the two commanding officers assigned to respond to that event would benefit from coordinating with one another ahead of time. A hostile scene is much more frequent in the U.S. today than an active shooter. Briefing together on a daily basis in preparation for that smaller event would have a consequent benefit for all responders when the large scale emergency eventually does occur.

Gawande also introduced the concept of discipline as it related to the adherence to protocol by captain Sullenberger and first officer Skiles. The concept of discipline is typically referred to as airmanship within aviation circles. Thus, while the briefing is essential to the pre-flight dynamic, airmanship is the glue that holds the cockpit together in the face of catastrophe.

Chapter IV will delve directly into that in-flight airmanship dynamic. The tools that can be used by police and fire officers in the midst of the emergency are discussed.

---

[111] Gawande, *The Checklist Manifesto*, Kindle location 2215–19.

[112] Ibid., Kindle location 2219–24.

Furthermore, Chapter IV directly correlates the challenges faced in an emergency in the cockpit to and emergency faced by a police and fire unified command team.

# IV.  IN-FLIGHT

Chapter III spoke to the meticulous calculation and preparation that all members of the aviation industry take in preparing to take off. Once in the air though, a completely different dynamic comes into play. When the cockpit door is locked, it is largely the responsibility of the flight crew to get the aircraft and passengers back to the ground safely. When an engine explodes or geese take out propulsion, those pilots who have consistently prepared for the worst are much better prepared to face that challenge head on. There are tools developed by aviation that can explicitly improve the in-flight behavior of pilots and emergency responders alike.

Atul Gawande suggests that professionalism in the face of adversity is a key component to all learned occupations. He provides direct insight into three elements needed by those learned occupations: "all learned occupations have a definition of professionalism, a code of conduct. It is where they spell out their ideals and duties."[113] The first three elements are selflessness, skill, and trustworthiness.[114] However, Gawande asserts that aviators have one, much more important code of conduct not shared by other industries, discipline.[115]

Gawande discusses difficulty of discipline:

discipline is hard—harder than trustworthiness and skill and perhaps even than selflessness. We are by nature flawed and inconstant creatures. We can't even keep from snacking between meals. We are not built for discipline. We are built for novelty and excitement, not for careful attention to detail. Discipline is something we have to work at. That's perhaps why aviation has required institutions to make discipline a norm.[116]

Discipline within aviation is largely synonymous with a more expansive and encompassing term: airmanship.

---

[113] Ibid., Kindle location 2307–09.

[114] Ibid.

[115] Gawande, *The Checklist Manifesto*

[116] Ibid., Kindle location 2318–21.

## A.    WHAT IS AIRMANSHIP?

"It's not pilots' hands that get them into trouble. It's their heads"[117]—such is the opinion of Robert Agostino, the chief pilot for Bombardier Aerospace and founder of the Bombardier Safety Standdown annual event. The mindset of a pilot and crew is thus extremely important. Those aviators who consistently seek to hone the art of flying are often considered model airmen. But, while "airmanship is accepted as being extremely important, it is a concept that has been difficult to define—it is something that all aircrew understand but seem unable to put into words."[118] It is readily accepted though that airmanship is one of the most important aspects of aviation success. A study of pilots themselves revealed, "stress tolerance, communication, and decision making were rated as most important by commercial pilots"[119] over technical flying ability.

Airmanship is "a personal state that enables aircrew to exercise sound judgement, display uncompromising flight discipline and demonstrate skillful control of an aircraft and a situation. It is maintained by continuous self-improvement and a desire to perform optimally at all times."[120] These are pilots who exhibit the calm, confident, global approach in the face of an emergency. Those pilots who exercise such discipline, day in and out, are the model that the aviation industry is cultivating.

A pilot who has lost an engine, for example, has a multitude of objectives that must be addressed in short order. Most importantly though, those objectives must be addressed in a disciplined and calm manner. Similarly, police officer responding to the scene of an active shooter incident has a multitude of objectives that must be addressed. Add to the situation a need for immediate medical treatment in addition to the need for law enforcement, then the importance of managing the scene with a disciplined, calm, confident approach is absolutely necessary.

---

[117] Fred George, "How to Construct a Culture of Airmanship Excellence," *Business & Commercial Aviation* 94, no. 1 (2004): 60.

[118] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 1.

[119] Nergård et al., "An Airman's Personal Attitude: Pilots' Point of View," 101.

[120] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 2.

## B. EXAMPLES OF AIRMANSHIP

Specific examples of pilots exhibiting airmanship can be found in many sources of literature. Two of them include Captain de Crespigny and Captain Sullenberger. Captain de Crespigny is credited as being one of the preeminent airmen of his generation. Much of that admiration comes from his decision to perform control checks on the final approach to landing the A380 back in Singapore. Before landing, de Crespigny made the decision to conduct a control check, which is a formal run through of the entire landing procedure—a high risk maneuver. De Crespigny explains:

> I knew we had to conduct multiple control checks as the configuration was changed…I thought it was best to get our landing 'dress rehearsal' out of the way at a safe altitude of 4000 before I committed to the approach and landing.…if I had to narrow down any one part of the flight that I think was critical to our successful outcome, it was the flight control checks.[121]

In recounting the airmanship of both Sullenberger and first officer Skiles, Gawande provides his assessment of their teamwork and discipline. Once both engines in flight 1549 lost thrust,

> the plane had only three and a half minutes of glide in it. In that time, Skiles needed to make sure he'd done everything possible to relight the engines while also preparing the aircraft for ditching if it wasn't feasible. But the steps required just to restart one engine typically take more time than that. He had some choices to make.[122]

Gawande continues:

> [Skiles] decided to focus almost entirely on the engine failure checklist and running through it as fast as he could…In the end, Skiles managed to complete a restart attempt on both engines, something investigators later testified to be 'very remarkable' in the time frame he had…Yet he did not ignore the ditching procedure, either…he got the distress signals sent, and he made sure the plane was properly configured for an emergency water landing.[123]

---

[121] de Crespigny, *Qf32*, Kindle location 2694.

[122] Gawande, *The Checklist Manifesto*, Kindle location 2268–70.

[123] Ibid., Kindle location 2270–77.

In discussing the actions of the entire crew onboard flight 1549, Gawande makes the case for airmanship for other industries:

> the crew of US Airways Flight 1549 showed an ability to adhere to vital procedures when it mattered most, to remain calm under pressure, to recognize where one needed to improvise and where one needed not to improvise. They understood how to function in a complex and dire situation. They recognized that it required teamwork and preparation and that it required them long before the situation became complex and dire. This was what was unusual. This is what it means to be a hero in the modern era. These are the rare qualities that we must understand are needed in the larger world.[124]

There is a distinct difference of course in the psychological challenge of a pilot seeking to save his own life—in addition to his passengers—by doing what it takes to land safely. In other words, Sullenberger and Skiles had a very vested interest in working well together during those three and a half minutes: each wanted to survive to fly again. Police and fire departments are rarely as intricately involved in the emergency as pilots are. Once they arrive to that scene, however, they are consciously putting themselves in just as much danger. Police officers run towards the gun shots and fire officials enter the structure and take care of victims in the midst of that gun fire. Both aviators and emergency responders are intricately involved in the dangers of the emergency upon engaging in it. As a consequence, just like Sullenberger and Skiles approaching their objective with airmanship, so too should police and fire commanders facing the same danger. Police and fire can and should strive to be the "heroes of the modern era"[125] because approaching a complex emergency with a sense of airmanship can save the lives of both victims and responders themselves.

## C.     CONSTRUCTING A CULTURE OF AIRMANSHIP

The culture of police and fire agencies is deeply rooted. Attempting to change that culture in favor of something new—like airmanship—will challenging. Aviation professionals have been able to shift from the engrained cockpit culture to one that

---

[124] Ibid., Kindle location 2303–06.

[125] Ibid.

embraces airmanship using the Kern model. The principals of the model could also benefit police and fire agencies.

Since 1996, Anthony Kern has stressed the importance of an airmanship model that all aviators can appreciate and gravitate towards. Kern argues that the way to entice culture change is not to force protocols on a group of professionals: "it's much easier to move toward something [such as the model] than to move away from something, such as avoiding accidents or reducing costs."[126]

George discusses the Kern model:

> '…is a revealing of things that have worked for aviators for 100 years,' Kern explained. 'I see two primary functions for the [Airmanship] model. First, it's a tool to evaluate where you are. And second, it's a framework that provides relevance for what you're trying to do. It's a skeleton on which to hang everything we do.'[127]

The Kern model for airmanship is visually represented in Figure 1.

---

[126] George, "How to Construct a Culture of Airmanship Excellence," 3.

[127] Ibid.
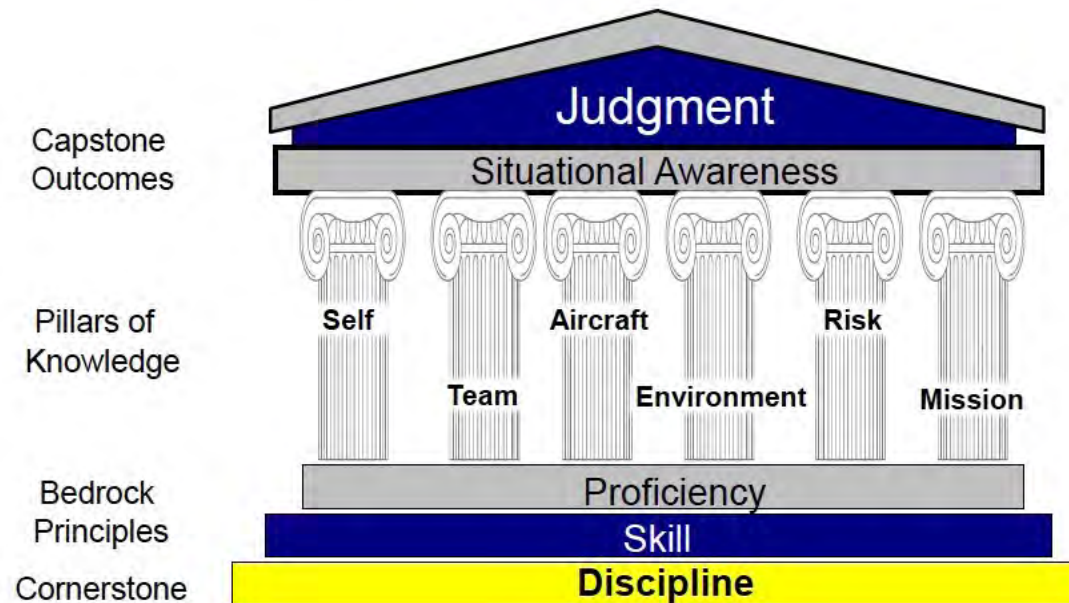
Figure 1.     The Kern Airmanship Model[129]

---

[129] Tony Kern, *Redefining Airmanship* (New York: McGraw-Hill, 1997), 22.

The Kern airmanship model consists of six basic components. As noted in the figure, "the model starts on a bedrock of discipline, one that mirrors the professional approach of top flight department organizations."[130] Discipline progresses to skill in flying the aircraft itself. Once skill is attained by the pilot, one must gain proficiency of those skills. The next level of the Kern model are the six pillars of knowledge. Those pillars include self, team, aircraft, environment, risk, and mission.[131]

Situational awareness and judgment cap the airmanship model. This approach to aviation has been a key driver in airmanship cultural change. While the components of the airmanship model are comprehensive, its design suggests that it can be adapted for use in changing the culture of the police and fire agencies in the U.S. If an *airmanship on the ground* model could be developed for police and fire agencies, the needed shift in culture could begin to take hold, just as it has in aviation.

## D. SPECIFIC CHARACTERISTICS OF AIRMANSHIP

In an effort to qualify specifics that make a good airman, ten qualities of effective airmanship have been identified by Ebbage and Spencer:

1. Discipline—abiding by procedures, despite the peculiarity of the situation.

2. Communication—keeping others (e.g., ATC) informed of developments.

3. Teamwork—working well together to resolve problems and maintain control.

4. Knowledge—having a deep understanding of aircraft systems and operation.

5. Expertise—transfer/retention of knowledge and skills.

6. Situation Assessment—analyzing and assessing unusual developments.

7. Judgement—calling upon prior training and expertise to resolve unusual problems.

8. Decision taking—taking decisive action.

---

[130] George, "How to Construct a Culture of Airmanship Excellence," 3.

[131] Ibid., 5.

9.  Resource management—allocating resources to ensure control of the larger situation is maintained whilst specific problems are being addressed.

10. Goal prioritization—prioritizing safety above personal concerns.[132]

Those 10 qualities of airmanship can be viewed, hypothetically, through the lens of a unified command police and fire team faced with an active shooter situation. As noted, during the first minutes of an active shooter event, for example, every responder—as Thomas Creamer in Chapter III notes—has the same incident priorities: life safety, incident stabilization, property conservation, and crime scene management.[133] Those incident priorities can be analyzed through that lens of the 10 airmanship qualities. In the sections following, an example of an active shooter in a mall is used to illustrate how each of the airmanship qualities could be correlated to benefit the outcome of an the event.

### 1. Discipline

Both police and fire commanders must have the discipline to not engage in tactical activity once they arrive to the scene at that mall. It is very tempting for a police sergeant or lieutenant—who, by protocol, should be establishing command—to want to follow his patrol officers into the mall to engage a shooter. During the Naval Yard Shooting in September 2013 for example, Washington DC Metropolitan Police Chief Cathy Lanier stated that she experienced just that problem: her police commanding officers engaged the shooter rather than staying outside to command the response.[134] Similarly, a captain or battalion chief on the fire side may be tempted to stop and render aid to an injured victim in the parking lot of the mall. Engaging in any of these tasks would be a detriment to the overall need to set up a strategic command presence to manage the event. Not running into the building and not stopping to render aid in lieu of setting up a command presence takes a profound amount of discipline.

---

[132] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 4.

[133] Creamer, "Multiagency Response to WMD," 1.

[134] As stated by Washington, D.C., Metropolitan Police Chief Cathy Lanier during the Center for Homeland Defense and Security Alumni Conference, keynote speech, Monterey, CA: March 4, 2014.

## 2. Communication

Clear, concise, communication at this active shooter event is critical. Communication starts with setting up the unified command. In many cases, the incoming fire commander should contact the police commander on their radio channel. If both police and fire commanders have conducted a briefing with one-another at the beginning of the shift, each would already have a firm grasp of the procedures that now need to be implemented as they are approaching the active shooter incident. Having the "airmanship" to now adhere to that pre-established communications procedure is paramount.

## 3. Teamwork

Teamwork between the fire and police commander at the unified command post is required. Once a command representative from fire meets with police at the preferred incident command post location, the two must immediately develop a productive working relationship. This includes introducing themselves to one another and cultivating trust so the strategic decisions they make as a team will improve the overall response. Both agents must work "well together to resolve problems and maintain control."[135] Having the discipline to embrace teamwork—not a take charge and demand answers approach— in the face of a highly complex emergency is a true display of airmanship.

Interagency teamwork is a key component to improving response capability on an active shooter or any other complex emergency. Facilitation of that teamwork between those agencies is the primary goal of instituting pre-shift briefings and airmanship into daily police and fire activities. Recommendations to help facilitate that teamwork are specifically provided in Chapter V.

## 4. Knowledge

Each commander must have a deep understanding of the respective tactics and tasks that must be implemented to facilitate the incident priorities. For example, a police lieutenant in the unified command needs to have learned specific techniques for policing

---

[135] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 4.

including urban assault, suspect takedown, weapons training, basic first aid, etc. Similarly, a fire commander needs to have knowledge of emergency medical extrication, triage, and treatment and transport of traumatically injured patients.

Furthermore, one might argue that it is equally important for a police commander to understand the intricacies of emergency medical response and transport while a fire commander should have a sound knowledge of police strategy and tactics. If each commander has an appreciation for the standard operational tactics of the other agency, they will each be able to adjust their strategy accordingly—thereby improving teamwork, capability, and life safety. The recommendations later in the thesis offer insight into how respective commanders can learn more about their counterpart's tactics.

### 5. Expertise

Each of those police and fire commanders are in their command level positions because they have retained task and tactical knowledge. Additionally, they also possess the expertise in how to apply global strategic management priorities to achieve life safety and stabilize the incident using ICS principles.

Those ICS principles include sizing up a scene, performa 360 of the structure, and gaining specific situational awareness (police and fire); establish a unified command between police and fire; identify the top incident priorities of life safety, incident stabilization, and property conservation; perform a risk benefit analysis (is there value to engaging in tactical operations); assign a strategic mode (e.g., are the members on scene going offensive to stop the problem, or are they defensive because it is too dangerous and there are no savable lives); identify a strategic goal for the incident; and relay tactical objectives for their subordinates.

### 6. Situation Assessment

Both commanders must constantly analyze, assess, and size up the situation. Rather than jumping immediately into action, both police and fire commanders need to take 30 seconds at the onset of a response to confer with one another about the following: reports on how many shooters, last known location of the shooter, approximate location

and number of injured people, and immediate resource need. With this information in hand, both commanders will have a much better understanding of the challenges they face. Taking that 30 seconds before making a decision requires airmanship.

### 7. Judgement

Once a good situational assessment has been attained, both police and fire commanders can to call upon their knowledge and expertise to make a judgment of the best course of action to take. These judgments may include holding the shooter to a specific portion of the mall and beginning to extract victims where the highest number of them have been noted by police.

### 8. Decision Taking

Once both commanders have assessed the situation and made a judgment, they must take coordinated and "decisive action"[136] to address the life safety problems at the scene. This includes the police commander setting up perimeter, the interior assault, and an extraction group supervisors to facilitate the priorities made by their joint judgment of the needs on the scene. The fire commander will likewise assign extraction, triage, and treatment and transport group supervisors to facilitate the medical need on the scene. Making these decisions have to be done in direct correlation with one another.

### 9. Resource Management

Ebbage suggests, "allocating resources to ensure control of the larger situation is maintained whilst specific problems are being addressed."[137] The resources en route to this active shooter incident are significant. Most likely, police dispatch will place a metro wide call for all available police resources. Depending on the size of that metro area, there may easily be over 100 police officers descending on the mall in short order. Additionally, the resources that will be ordered by the fire commander are comprehensive. In order to facilitate the rescue of a large amount of injured victims, multiple fire apparatus, ambulances, and personnel are be needed. Both police and fire

---

[136] Ibid.

[137] Ibid.

commanders need to manage those incoming resources while insuring that current resources on hand are engaging in task and tactical operations. Moreover, the assigned group supervisors can now feed resource requests to their requisite commanders. For example, the police perimeter group supervisor may need an additional 15 police cars on the north side of the mall. That supervisor can request those resources to the police commander for fulfillment. Similarly, the extraction group supervisor on the fire side may need an additional three engine crews to facilitate a continuous extrication to the casualty collection point. This, too, can be relayed to the fire command.

### 10.    Goal Prioritization

As noted, the goals of the response to this mall shooting are to provide for life safety, stabilize the incident, conserve property, and manage the crime scene. Life safety—the priority of stopping the violence and saving the lives of the injured—is always the most important goal. Thus, those commanders must continuously assess the situation for changes. When changes occur that improve life safety, the incident priorities can adjust to move on to incident stabilization. Having the discipline to adhere to this is a preeminent representation of airmanship. By heeding the established principles of airmanship on the scene of a complex emergency, police and fire can immediately improve the outcome of the event.

### E.    ANALYSIS

Many firefighters going through a fire academy in the U.S. today are likely to hear the trash collector analogy. An instructor in the last days of an academy may announce to the class something to the effect of:

> Ladies and gentlemen, your job is no different from a trash collector: each trains for a specific task—the sole purpose for their career. A trash-man goes to work every morning, he checks out his rig and heads off to do his job. When he turns a corner to find an alleyway filled with mounds of trash, do you think he freaks out? Do you think he rushes, headlong down the alley throwing the trash around randomly? Nope, he proceeds, methodically down the alley, and does his job. Why then, with all of the training you have been provided, with the oath that you are preparing to take, would you pull around a corner to find a house on fire and freak out, not assess the situation and break down? You are now firefighters; take

that charge with a calm, confident, approach. For it is the stoic, master of his craft, who will make that save when it is most crucial. You are professionals now. Prove it.[138]

A firefighter is trained to fight fire. To calmly enter a burning structure, search for victims, and put the fire out. Firefighters also face complicated medical and traumatic patients, which can stress their ability to remain calm. Many fire service instructors, officers, and chiefs around the country seek to teach and reinforce the discipline to take a deep breath, relax, and assess the situation before committing to fighting a fire or start medical treatment on a critical patient. Similarly, police too seek to improve upon their calm approach to their craft: diffusing hostile situations, calmly assessing a situation, and managing their resources are all a goal of police educators.

Discipline for police or fire continues to be a challenge. For example, firefighters lose their lives every year because of a lack of this discipline. Anthony Kastros cautions, "improper risk assessment (poor size-up), lack of incident command, lack of accountability, inadequate communications, and lack of standard operating guidelines (SOGs)—or failure to follow them—can lead to firefighter line-of-duty-deaths (LODDs) and injuries and chaos on the fireground."[139] The challenges faced at the scene of a structure fire as noted by Kastros are exponentially increased when police are involved with the same "lack of incident command, lack of accountability, and inadequate communications"[140] at the same time and in the same place. What is more, the incident that initiates a response from both police and fire is not something like a homicide or house fire. These incidents are often highly volatile, chaotic, man-made emergencies that are not the norm for commanding officers. Thus, managing those incidents confidently is all the more critical.

Airmanship—a calm, confident, communicative, disciplined, team approach to managing a complex emergency—is an exceptional tool to guarantee that lives will be

---

[138] Ryan Fields-Spack, "Takin out the Trash," October 15, 2014, https://medium.com/homeland-security/takin-out-the-trash-12e3b5e6b4dc

[139] Anthony Kastros, "Mastering Fireground Command: 10 Commandments of Command," Fire *Engineering Magazine*, August 2011, 1.

[140] Ibid.

saved and the incident will be stabilized. According to George, "If a black swan event occurs, 'You can't afford to get into the startle effect,' de Crespigny says. 'The natural instinct is to fight, fly or play dead. You have to sit back, look at the situation and prioritize.'"[141] An active shooter in a mall is a black swan event for many cities in America. These massively complex emergencies cannot be managed by losing one's cool, raising one's voice, and refusing to work as a team. One must take a moment, "sit back, look at the situation and prioritize"[142] ones goals and objectives. During a complex emergency, one must display and exude impeccable airmanship.

---

[141] George, "Qantas Flight 32," 46. A black swan event is an event that comes on without warning and has a major effect on one's operations.

[142] Ibid.

# V. CONCLUSION

## A. FINDINGS

This thesis hypothesized the following: police and fire departments today are challenged with an increasing frequency of complex emergencies and a continuing cultural divide. Devoted people from both agencies are actively working to improve their own agencies response capability. Rather than solving the problem solely in house, smart practices from other disciplines may be able to help. The application of some of the researched and proven smart practices of other disciplines could serve as a springboard to effective improvement in response. In an effort to explore that hypothesis, one question was asked: what can the aviation industry teach the emergency services field about how to approach complex—life sensitive—problems? The previous four chapters have sought to answer that question.

This thesis found that complex emergencies—those where both police and fire agencies must engage the threat immediately while in the same geographic space—will continue to increase in frequency. Chapter I, for example, found that structure fires are decreasing[143] while active shooter events are on the rise.[144] Furthermore, Chapter I assessed the dynamic of a combined police/fire emergency—like an active shooter—and how it presents a different challenge to those response agencies. Primarily though, this thesis assessed aviation practice and provided direct corollary insight into how those aviation practices could be implemented to improve the response to complex emergencies by police and fire.

Chapter III provided a detailed analysis into one method that the aviation industry uses to approached complex—life sensitive problems. It detailed how a hand shake, teamwork, and a pre-flight briefing dictates the process of preparing to fly an airplane. Crew resource management, the tool for facilitating a successful pre-flight briefing,[145]

---

[143] Neyfakh, "Plenty of Firefighters, but Where Are the Fires?."

[144] Peterson, and Schweit, *A Study of Active Shooter Incidents*, 6.

[145] Prabhakar, "Translation of Aviation Safety Principles to Patient Safety in Surgery," 221.

was also assessed. That analysis was then assessed in relation to how police and fire agencies interact today, and how they may improve that interaction by absorbing some of those aviation principles.

Chapter IV assessed a more psychologically based principle that aviation embraces in its approach to complex, life sensitive problems. Specifically, it assessed how pilots have been trained to calmly approach every dangerous situation with discipline and poise through airmanship. Components of airmanship and how they are institutionalized within the aviation industry were also evaluated. An analysis of 10 airmanship characteristics were then assessed as they may correlate to police and fire agencies in a complex, life sensitive emergency.

By assessing aviation practices in terms of how those practices may correlate to the daily activity of a given police or fire agency, this thesis stayed true to the research question. The analysis shows that lessons learned from aviation have direct applicability to a police or fire commander on the ground at a complex emergency.

Two specific applications from those lessons learned are conducting a pre-shift briefing and instituting the principle of airmanship (discipline) into scene management by police and fire command officers. Those two concepts are addressed in depth within the recommendations section.

While direct assessment of aviation activity provides two concrete corollary recommendations that police and fire can embrace, more research is needed to implement such change. This thesis did not delve deeply into the scholarly literature available that describes specific training programs and organizational details that led aviation to succeed in their change endeavors. Consequently, further research is suggested to ascertain more detailed information on how aviation made the change.

## B.    CONCLUSIONS

The findings of Chapter I–IV of this thesis indicate that aviation principles of CRM, pre-shift briefings, and airmanship could be adapted to the police and fire agencies

in this country. As noted in Chapter III, a siloed[146] approach to emergency response is no longer appropriate in the new reality of threats facing the public. Police and fire commanders who never pre-plan how they will work together, never train together, and have never even shaken hands with one another may likely decrease life safety at an emergency. It would be foreign for the pit crew and Nascar driver to expect to show up at a race and be proficient if they have never trained with one another. Why should an emergency response be any different?

As noted in the literature review, the aviation industry has fundamentally changed its culture twice since 1935. First with the development of the checklist,[147] and then with the development of crew resource management.[148] What is more, the members of the aviation industry, as noted in the analysis in Chapters III and IV, continue to hone and improve upon their skills—always looking to do better.

Two specific practices that aviation has honed since 1935 are the pre-flight briefing and airmanship. First, the pre-flight briefing is critical to getting all players—including baggage handlers, ground crew, administration, air traffic control, flight attendants, and pilots[149]—on the same page before an emergency happens. Aviators use it to build a team, review, and create plans before every single flight. Similarly, police and fire may be able to utilize the concept of a *pre-flight* briefing and adapt it to conduct a *pre-shift* briefing between police and fire commanders before those members begin every shift.

Second, discipline, or airmanship, in aviation is a mindset that is taught to every pilot but only the best maintain.[150] At its core, airmanship "is about having an appropriate attitude and a desire to perform optimally at all times—this personal conviction will enable aircrew to attain the highest levels of airmanship performance."[151] Aviation's

---

[146] Fahy, "Understanding "'Swift Trust,'" 41–42.

[147] Meilinger, "When the Fortress Went Down," 81.

[148] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 178–81.

[149] Cahill, McDonald, and Losa, "Understanding and Improving Flight Crew Performance," 44.

[150] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 2.

[151] Ibid., 11.

embrace of airmanship or discipline is a concept that, if adapted for use by commanders at an emergency, could provide a benefit to the capability of police and fire agencies.

## C.    RECOMMENDATIONS

This thesis recommends a departure from the status quo on daily police-fire activity. Three specific changes are suggested. First, this thesis recommends that FEMA adopt a change to the National Incident Management System to include a daily pre-shift briefing as a requirement. Second, a specific pre-shift briefing regimen that should be conducted each shift is suggested. Third, this thesis recommends requiring implementation of a disciplined response for all strategic level commanders in the country.

### 1.    Recommendation 1: Amend FEMA NIMS/ICS Doctrine

As noted in the literature review, *Homeland Security Presidential Directive 5* explicitly allots federal funding only to those agencies who formally adopt NIMS principles.[152] FEMA holds explicit purview over both NIMS and ICS policy. While it has been acknowledged in this thesis that adoption of FEMA's NIMS and ICS principles by police and fire agencies is a challenge, they do remain the primary enforcement mechanism of the federal government.

This thesis recommends formally adding recognition of the importance of a pre-shift briefing to FEMA ICS doctrine. Presently, FEMA ICS literature recommends three specific planning processes: "the planning process may begin with [1] the scheduling of a planned event, [2] the identification of a credible threat, or [3] the initial response to an actual or impending event."[153] The first and second planning process—"scheduling of an event [or] the identification of a credible threat"[154]—are long-term exercise based planning activities. While these are beneficial, they do not address the challenges that can arise on a daily basis.

---

[152] White House, *Homeland Security Presidential Directive/HSPD-5*.

[153] Federal Emergency Management Agency, *Incident Command System* (Washington, DC: U.S. Department of Homeland Security, 2008), 18.

[154] Ibid.

The third recommendation for when planning should take place is "the initial response to an actual or impending event."[155] FEMA suggests then that the third recommendation "process continues with the implementation of the formalized steps and staffing required to develop a written Incident Action Plan (IAP)."[156] As articulated in this thesis, the beginning of an emergency is not the time to begin planning for how it will be addressed.

This thesis recommends adding a fourth planning process to the established FEMA ICS doctrine—the pre-shift briefing. The following language for that fourth step is suggested to read as such:

> Man-made emergencies, like an active shooter, bombing, or terrorist act require that multiple agencies respond and mediate the problem together. In order to facilitate improved coordination between each of those response agencies in the unified command, local police, fire, and EMS agencies shall conduct <u>daily</u> pre-shift briefings with one another. These daily strategic level emergency response briefings will facilitate improved interpersonal relations, teamwork, and execution on all interagency emergencies, large and small. A pre-shift briefing should be conducted during the morning shift change for all interagency emergency response partners. Items to be discussed in the briefing include:
>
> - Making Introductions
> - Review of pertinent daily activity and standard operating procedures
> - Relaying of expectations during complex emergencies by commanders
> - Sign-off of the briefing.

### 2. Recommendation 2: Conduct Daily Strategic Level Pre-shift Briefings

This thesis recommends that strategic level officers from both police and fire conduct a pre-shift briefing daily. It is acknowledged that many police and/or sheriff departments may interact with a number of separate fire departments within one jurisdiction. Thus, the use of technology to facilitate pre-shift briefings could be used to

---

[155] Ibid.

[156] Ibid.

bridge geographical divides between agencies. Another limitation to this model is the fact that most police and fire agencies work different types of shifts. Typically, fire will work a 24 or a 48 hour shift while police often work eight or 10 hour shifts. Thus, further research is suggested to investigate how various public safety agencies can best facilitate a briefing with one another—either in person or by use of teleconferencing. This research can be conducted via the working group outlined in the implementation portion of this chapter.

Given the logistical challenges associated with getting commanders together, the use of technology to facilitate a pre-shift briefing is recommended. There is multiple video conference technology today that can aid in conduction a briefing. The briefing should include individuals on the police side that are the rank of sergeant, lieutenant, and captain. The fire side should include ranks of lieutenant, captain, and battalion chief. Furthermore, multiple meetings should be conducted based on the size of the jurisdiction. If a fire department, for example, has three different jurisdictional battalions, it would be advisable to conduct three separate briefings with the command level staff of a similar police district. This is important to insure that the command level officers who respond together, brief together. Components of the pre-shift briefing model appear in Figure 2.
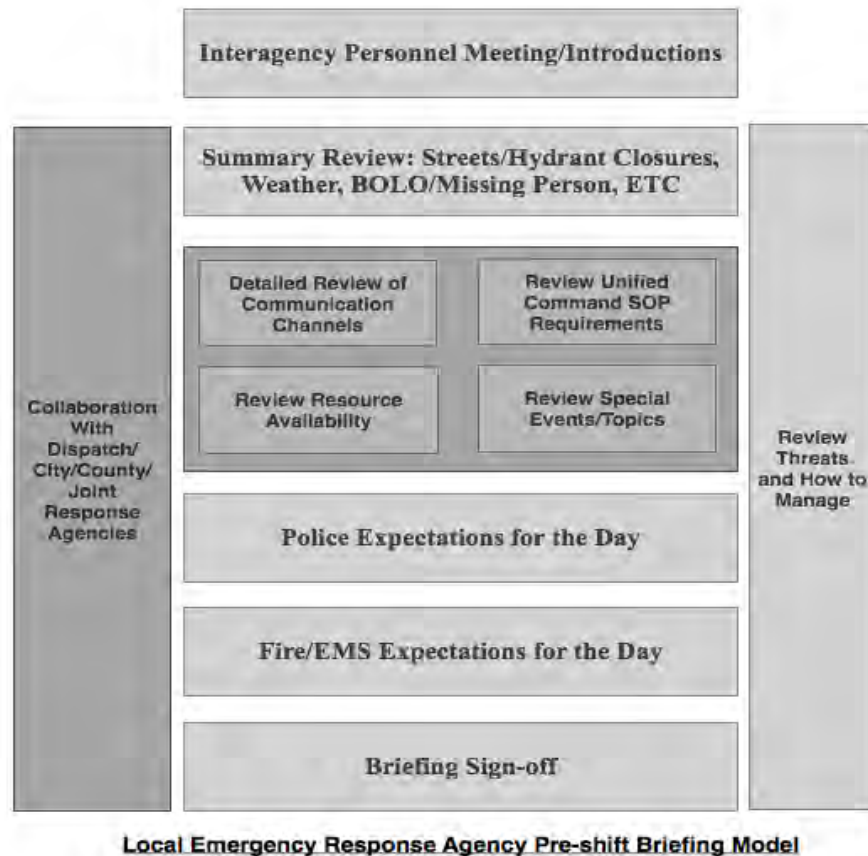
Figure 2.    Example Pre-shift Briefing Model[157]

The components of the briefing reflect the briefing model noted above. Each component will take place in the following sequential order.

### a.    Crew Meeting/Introductions

As assessed by Gordon, Mendenhall, and O'Connor, "…the importance of introductions cannot be overstated: research has indicated conclusively that the act of simply exchanging names has a measurable positive impact on team building and communication (and interestingly, also on job satisfaction)."[158] With the assessment of the importance of introductions in mind, this thesis recommends starting every pre-shift

---

[157] Adapted from Task Forkflow Figure 1.34 of: Cahill, McDonald, and Losa, "Understanding and Improving Flight Crew Performance," 34.

[158] Gordon, Mendenhall, and O'Connor, *Beyond the Checklist*, Kindle location 1197–99.

briefing with a formal facilitation of introductions with all members in attendance. These interactions will be done on a first name basis. It is important to acknowledge the fact that technology does not allow for physical handshakes. The act of the introduction, as noted in the analysis in Chapter III Section B, remains important in the absence of physical contact. Consequently, if technology is the primary form of conducting the daily pre-shift briefing, this thesis suggests that commanders utilize the initial briefing as a springboard for improving upon those relationships should they meet one another later in the shift.

### b.      *Summary Review of Administrative Information*

This will be a point where the police and fire commanders conducting the meeting will announce administrative information such as street and hydrant closures, weather, be-on-the-lookout (BOLO) information, missing persons, and any other information that needs to be passed along.

### c.      *A Detailed Review of the Following*

The components of the briefing will include the following four core components:

(1)      Communications Model/Channel

This thesis recommends police and fire agencies adopt the following communication procedures for complex emergencies. Additionally, it is recommended that the responding fire commanders switch to the operational police channel at the scene and request face-to-face interaction and a unified command post location. This will ensure that police are always on their preferred radio channel, thus not risking missing any critical-officer-in-distress communication. Once face-to-face communication is established, both commanders can operate on their respective radio channels. The procedure for establishing this radio communication will be reviewed with all in attendance at the briefing.

(2)      Review of Unified Command Requirements

A quick review will be provided on the requirements for both police and fire agencies to establish a unified command at any joint operational event. Clarification will

be made to ensure that all members know that a unified command/face-to-face contact is required even on small incidents like an assault in a house. Traditionally, a fire engine may stage away from the scene until it is declared safe by police. A new requirement would be for the engine lieutenant to contact the police sergeant on the scene and the two meet. This would greatly improve the response time for an injured party if both agencies had real-time situational awareness as a result of that unified command.

(3)     Review of Resource Availability

A review of available resources will provide situational awareness for both police and fire before the incident starts. For example, SWAT may be at an all-day training and unavailable, or ambulances may be exceptionally busy and on an expanded response time. Or perhaps special event may have fire resources dedicated in the north part of the city. All of these items are important when the unified commanders come together at an emergency and decide how to allocate their resources.

(4)     Review of Special Topics and Events

Any special events, exercises, or other items of interest should be reviewed by all agencies at the briefing.

### d.     *Police Expectations for the Shift*

This is the opportunity for police commanders to voice their expectations for emergency response during the shift. It is here where a commander may state that she wants her fire counterpart to contact her immediately upon being dispatched to establish situational awareness and set a place to make face-to-face contact. This is where any intricacies of how a scene is to be managed on the police side will be spelled out.

### e.     *Fire Expectations for the Shift*

Similarly, fire should take this opportunity to outline its expectations. That commander may request police officers to keep their vehicles out of the way of ingress opportunities for ambulances. If that is not possible, he may request that police leave their keys in the vehicle so it can be moved. Additionally, the fire commander may suggest that he prefers to stage his engines and ambulances away from the hostile scene but will

plan to head directly to the police command vehicle. These requests will be agreed upon or amended per the commanders on scene so everyone has an understanding of the expected actions that will take place during the emergency later.

### f.    Collaboration/Threat review and Briefing Sign-off

It is expected that all members collaborate directly with all other players not at the meeting. This includes, for example, working with dispatch to check that radio channels are operational, coordination of with public works crews for street related problems, or collaboration with city and county management where needed.

In addition to this collaboration, every step of the briefing will reference any potential threats and how to manage them. All members are encouraged to ask questions at any time. If a question arises about whether an acting lieutenant on the fire side, for example, should be setting up a unified command with a police captain, the answer can be provided immediately. Finally, all parties sign off on the briefing and start their shifts.

It is important to note that the briefing process sets the tone for the team that will be working together for that shift. As noted by Zijlstra, Waller, and Phillips:

> the initial moments of team development prior to work activities are extremely important to subsequent team outcomes. In this period, teams normally develop and build the trust that helps communication patterns involved in exchanging and sharing information, which are crucial for team performance.[159]

It is the pre-shift briefing that will facilitate this team development and trust cultivation.

### 3.    Recommendation 3: Disciplined Response

This thesis recommends that police and fire agencies collaborate at the administrative level to improve commander discipline at the scene of complex emergencies. As explained by Ebbage and Spencer, discipline—or airmanship in the aviation industry—is "a personal state that enables aircrew to exercise sound judgement, display uncompromising flight discipline and demonstrate skillful control of an aircraft and a situation. It is maintained by continuous self-improvement and a desire to perform

---

[159] Zijlstra, Waller, and Phillips, "Setting the Tone," 750.

optimally at all times."[160] This dedication to discipline is lacking in many of today's police and fire departments.

Discipline in responding to emergencies starts at the training academy. It is then perpetuated by leaders who continually display to and cultivate such discipline in their subordinates. This thesis argues that a disciplined response is just as important for public safety agencies as it is for aviation. As such, discipline should be a mainstay in both training and evaluation starting on the first day in the academy and throughout one's career. This would be facilitated by a re-tooling of certain academy and in-service trainings provided to line level police and fire responders. As assessed in Chapter I, simulator training could be developed and used by police and fire personnel to train to the complex emergency—just as pilots participate in mandatory simulator training as a part of their continuing education. Additionally, placing specific airmanship qualities into standard operating procedures (SOP) will reinforce that training on a daily basis.

## D.    IMPLEMENTATION

The implementation of the above three recommendations would require an interagency complex emergency working group to best facilitate this change in operations. The working group should be sponsored and chaired by the FEMA Office of Protection and National Preparedness deputy administrator. Members of this working group should consist of representatives from the International Association of Chiefs of Police, National Sheriffs' Association, International Association of Firefighters, International Association of Fire Chiefs, International Academies of Emergency Dispatch, and the National Association of Emergency Medical Technicians. Furthermore, members from those public safety associations should be strategic level staff from police/sheriff, fire, ambulance, and dispatch agencies. The interagency complex emergency working group can identify implementation strategies for the recommendations noted above. Suggestion for further review includes these recommendations, as described below.

---

[160] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 2.

1.    **Working Group Suggestions for Recommendation 1: Amend FEMA ICS Doctrine**

The working group can institute a comprehensive review of both NIMS and ICS doctrine and determine where a pre-shift briefing component can be placed. Additionally, the study of both NIMS and ICS doctrine provides an opportunity to update any principles that are deemed either out of date or in need of refreshment by those agencies who use ICS every shift.

2.    **Working Group Suggestions for Recommendation 2: Conduct Daily Strategic Level Pre-shift Briefings**

The working group can take the recommendation to conduct daily briefings and explore options and challenges for implementing such a change across the board. Small agencies may have an easier time implementing briefings when compared to a large agency. A multitude of factors in implementing this recommendation can be explored.

Among those implementation factors, one requiring further study could be the factors associated with changing the culture of an organization. The culture of police and fire department pre-shift activity is established and varies greatly. For example, police may have briefings with superiors prior to beginning their shift's activities. Some fire agencies may engage in roll call line-up drills prior to each shift. While the intricacies of established pre-shift protocol vary greatly across the country, they are all quite habitual. Ouellette and Wood delve into the intricacies of habitual behavior by suggesting:

> …past behavior guides future responses through 2 processes. Well-practiced behaviors in constant contexts recur because the processing that initiates and controls their performance becomes automatic. Frequency of past behavior then reflects habit strength and has a direct effect on future performance. Alternately, when behaviors are not well learned or when they are performed in unstable or difficult contexts, conscious decision making is likely to be necessary to initiate and carry out the behavior. Under these conditions, past behavior (along with attitudes and subjective norms) may contribute to intentions, and behavior is guided by intentions. These relations between past behavior and future behavior are

substantiated in a meta-analytic synthesis of prior research on behavior prediction and in a primary research investigation.[161]

Since past behavior likely dictates future behavior, it is reasonable to ascribe some difficulty in changing that future approach. Asking police and fire agencies to completely change their pre-shift procedure will likely cause pushback amongst all levels of the departments.

There is literature, however, that can assist with nudging people to change their behavior more readily. For example, Richard Thaler and Cass Sunstein have conducted extensive research in the area of libertarian paternalism. They argue in their book, *Nudge*, that people often take the choice that is given to them, and once they prescribe to that choice, embrace it as the norm. Once that past behavior is established, the research shows it will continue on that path. Thaler and Sunstein suggest:

> Many people will take whatever option requires the least effort, or the path of least resistance. …[This implies] that if, for a given choice, there is a default option—an option that will obtain if the chooser does nothing— then we can expect a large number of people to end up with that option, whether or not it is good for them. And as we have also stressed, these behavioral tendencies toward doing nothing will be reinforced if the default option comes with some implicit or explicit suggestion that it represents the normal or even the recommended course of action."[162]

In other words, when a firefighter enters the firehouse on her first day of probation (the time after the academy where a firefighter is responding to live emergencies for the first time), she will immediately adhere to the established procedure within that fire house. She takes the path of least resistance, thereby developing a new habit for the start of her shift.

Additionally, Thaler and Sunstein assess this adherence is a potential ally for change, however. They suggest that the "combination of loss aversion with mindless choosing implies that if an option is designated as the 'default,' it will attract a large

---

[161] Ouellette, and Wood, "Habit and Intention in Everyday Life: The Multiple Processes by Which Past Behavior Predicts Future Behavior," *Psychological Bulletin* 124, no. 1 (1998): 1.

[162] Richard H. Thaler, and Cass Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (New Haven, CT: Yale University Press, 2008), 86.

market share. Default options thus act as powerful nudges."[163] The concept of a nudge, while unimpressive at first glance, has the potential to fundamentally shift one's mindset.

Furthermore, Thaler and Sunstein provide two examples of how a nudge can manifest itself in society:

> first, never underestimate the power of inertia. Second, that power can be harnessed. If private companies or public officials think that one policy produces better outcomes, they can greatly influence the outcome by choosing it as the default….setting default options, and other similar seemingly trivial menu-changing strategies, can have huge effects on outcomes, from increasing savings to improving health care to providing organs for lifesaving transplant operations.[164]

Thaler and Sunstein further argue that "…seemingly small features of social situations can have massive effects on people's behavior; nudges are everywhere, even if we do not see them. Choice architecture, both good and bad, is pervasive and unavoidable, and it greatly affects our decisions."[165]

While *Nudge* focuses primarily on public opportunities for change, the authors believe the concepts within the book can be applied much more broadly:

> but the range of potential applications is much broader than the topics we have managed to include. One of our main hopes is that an understanding of choice architecture, and the power of nudges, will lead others to think of creative ways to improve human lives in other domains.[166]

It is with this in mind, that nudges are assessed in this thesis as a means to incentivize a change in the pre-shift activities of police and firefighters.

In order to facilitate an easier change in culture toward that of a daily pre-shift briefing, Thaler and Sunstein's use of the *Nudge* can be incorporated. Thus, three distinct nudges could be evaluated by the working group to help alleviate resistance to the pre-shift briefing: required information, command expectations, and use of technology.

---

[163] Ibid., 35.

[164] Ibid., 8.

[165] Ibid., 255.

[166] Ibid.

### a.  Required Information

Depending on the department, there are often specific pieces of information that are sent out to crews before every shift. Items may include street closures, fire hydrant outages, event information, weather info, BOLO, missing persons, etc. While these pieces of information are often critical for daily operations, many of them are simply emailed to all crews so they can be checked at leisure. A way to nudge police and fire personnel to embrace the pre-flight briefing is to present that type of information only during the briefing. Since the briefings will be held among police and fire crews in a certain part of the city, for example, command officers can read off only the street closures that pertain to their area of the city. If required information that was previously emailed is now orally presented, it will serve to: 1) improve retention of the information, and 2) immediately change the default choice of where information is gathered.

### b.  Commander Expectations

Every person is different. Police officers or firefighters who has risen to the level of a commander in their department will likely have a specific preference on how they want their emergency scenes managed. For instance, a police commander may be very strict on radio etiquette and discipline when engaging in potentially dangerous scenes, and a fire battalion chief may want police officers to park in a certain way at the scene of a fire. If individual commanders are encouraged to express those desires to all of the crews that will be working with them for that shift, it is likely that they will embrace the concept of a pre-shift briefing more readily. Moreover, these operational procedures can be a required process of each briefing, thereby helping to insure that each member of the police-fire team understands the plan before arriving at the emergency later in the shift.

### c.  Use of Technology

By utilizing technology to facilitate the briefing, the challenge of bringing crews physically together will be alleviated. The pre-shift briefing can be built into daily activity whereby all crew log into the briefing quickly and easily.

The three nudges noted above have minimal cost, are simple to implement, and can fundamentally change the choices available for a pre-shift schedule. While they may

not force a full-scale embrace of the pre-flight briefing immediately, it will begin to affect future behaviors. Both Thaler and Sunstein assert, "choice architecture and its effects cannot be avoided,…call it the golden rule of libertarian paternalism: offer nudges that are most likely to help and least likely to inflict harm."[167] As noted in this thesis, improvements in police-fire coordination need to be made. Many of the recommended changes require some significant cultural shifts on the part of departments; however, those shifts can be made more palatable with just a simple nudge.

### 3. Working Group Suggestions for Recommendation 3: Disciplined Response

The working group should be tasked to review and study how best to implement a priority of discipline amongst all public safety responders. This would consist of further study into how aviation has instituted a culture and priority of airmanship. Furthermore, the working group could explore how best to provide education on the concept of a disciplined response. This may include drafting specific FEMA sanctioned training programs to be included in police and fire academy curriculum.

Some of the principles that could be explored in drafting such a training program can be lifted directly from aviation as well. As noted in the literature review, Ebbage and Spencer provide a rubric for teaching airmanship. These foundational concepts can be adapted to training for a disciplined response. These 15 are listed below.

*Knowledge*: Police and fire should cultivate and develop the airmanship foundation[168] of knowledge.

*Craft*: All police officers and firefighters should have a sound knowledge of their craft—the dynamics of policing and intricacies of firefighting. Moreover, each should have a knowledge of the concept of a complex emergency and what role each will play when they come together to work at that incident.

---

[167] Ibid., 74.

[168] Ebbage, and Spencer, *Airmanship Training for Modern Aircrew*, 6.

*Environment*: knowledge of the physical, regulatory, and organizational[169] environment surrounding police and fire agents.

*Risk*: understanding the risks of engaging an active shooter or caring for a victim in a hostile environment is key for appreciating those tasks. Knowledge that it is expected for a police officer and firefighter to take on a high level of risk when there are savable lives should be incorporated into joint trainings between the agencies.

*Skills*: Police and fire should cultivate and develop the airmanship foundation[170] of skills.

*Physical*: All of the physical skills that are currently expected of a police officer or firefighter will continue to be a critical component to operation.

*Communication*: Just like that airmanship model, police and fire should develop the following communication skills: "vigilance in monitoring communications, using appropriate communication (phraseology, clear, concise), active listening, and inquiry through communications."[171]

*Cognitive*: similarly, police and fire follow the cognitive skills model, including: Understanding and maintaining situational awareness, problem solving/decision making skills, understanding and managing workload, and self-assessment."[172]

*Team*: finally, just like the airmanship model for team skills, police and fire need to develop the following: "performance monitoring, leadership/initiative, interpersonal skills, co-ordination & decision-making, and team communication and situational assessment."[173]

*Attitudes*: Police and fire should cultivate and develop the airmanship foundation[174] of attitudes.

---

[169] Ibid.

[170] Ibid.

[171] Ibid.

[172] Ibid.

[173] Ibid.

[174] Ibid.

*Hazardous attitudes*: police and fire personnel should be taught the antidote to the five hazardous attitudes of anti-authority, impulsivity, invulnerability, macho, and resignation.[175]

*Professionalism*: police and fire should understand "the values and principles embodied in airmanship."[176]

*Self-improvement*: police and fire should develop and maintain a constant need for self-improvement. This includes "developing the motivation needed for life-long learning, understanding the requirement for self-assessment…" at the complex emergency and "developing the will to achieve performance excellence."[177]

*Discipline*: perhaps the most important and difficult to teach. Discipline can include any of the following: emergency preparation, vigilance, situational assessment, size-up, and operational and regulatory policy. It also includes knowledge and skills maintenance, post-emergency evaluation, and self-discipline to manage stress and attitudes.[178]

*Assessing discipline*: finally a continuous assessment and reassessment of the disciplined response qualities within police and fire can be improved upon.

An infrastructure for training America's police officers and firefighters is well established. Consequently, adjusting some of those training regimens to include the above skills, foundations of airmanship, and assessment could have a dramatic impact on the performance of both agencies at the scene of a complex emergency. Further research is needed to fine tune an educational model but, "outstanding airmanship [or discipline] can only be achieved by placing… [disciplined response] training at the very heart of a training system rather than as an adjunct."[179]

---

[175] Ibid., 8.

[176] Ibid., 6.

[177] Ibid.

[178] Ibid.

[179] Ibid., 11.

## E. REFLECTIONS

Arrival to the scene of a mall on a report of an active shooter and being greeted by over 1,400 frantic patrons—many of them covered in blood—is a challenge most emergency responders hope never to be tasked to manage. The awesome responsibility given to the initial commanders of such an incident are profound. What is more, the decisions that police and fire strategic commanders make in the first minutes of that response have a direct effect on the lives of those involved.

That type of responsibility cannot be taken lightly. Emergency responders have a duty to be at the height of operational task, tactic, and strategic awareness. Those charged with commanding that incident have a duty to improve upon their capabilities. Additionally, they have a duty to cultivate relationships with their interagency peers and to uphold the highest level of discipline. Failure in adhering to this duty means failure to save the life of a person who could have made it.

THIS PAGE INTENTIONALLY LEFT BLANK

# LIST OF REFERENCES

Associate Press. "Lax Shooting Victim Bled Alone for 33 Minutes." *CBS News*, November 15, 2013. www.cbsnews.com/news/lax-shooting-victim-bled-alone-for-33-minutes-ap/

Baker, Al. "17 Floors up, Rescue of 3 Shows Clash of Agencies." *New York Times*, April 14 2012.

Boyne, Walter J. "The Checklist." *Air Force Magazine* 96, no. 8 (2013): 54.

Brick, Michael. "Crime Scene or Rescue? Man in Chimney Causes a Clash." *New York Times*, June 28, 2003.

Buck, Dick A., Joseph E. Trainor, and Benigno E. Aguirre. "A Critical Evaluation of the Incident Command System and Nims." *Journal of Homeland Security and Emergency Management* 3, no. 3 (2006): 1–27.

Burke, Ryan. "Out with the Old, in with the New: Embracing Dual Status Commanders in the Future of Homeland Defense and Security." 2014. https://www.hsdl.org/?view&did=754722

Cahill, Joan, Nick McDonald, and Gabriel Losa. "Understanding and Improving Flight Crew Performance of the Preflight, Flight Planning, and Briefing Task." *The International Journal of Aviation Psychology* 23, no. 1 (2013): 27–48.

City of Aurora Police Department. "Active Critical Incidents Directives Manual." In *Protocol 12.9*. Aurora, CO: City of Aurora, 2013.

Coleman, John. "Skip. "Working with the Police at MVAs." *Fire Engineering* 158, no. 3 (March 2005): 38–47.

Creamer, Thomas. "Multiagency Response to WMD." *Fire Engineering* (November 2005): 5–8.

de Crespigny, Richard. *Qf32*. Sydney, Australia: Pan Macmillan Australia, 2012.

Donahue, Amy K., and Robert V. Tuohy. "Lessons We Don't Learn a Study of the Lessons of Disasters, Why We Repeat Them, and How We Can Learn Them." *Homeland Security Affairs* 2, no. 2 (2006): 4–8.

Ebbage, Louise, and Phil D. Spencer. *Airmanship Training for Modern Aircrew*. Bristol, UK: BAE Systems, 2004. http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA428471

Esposito, John M. "New York City Fire Department Chief Officer's Evaluation of the Citywide Incident Management System as It Pertains to Interagency Emergency Response." Master's thesis, Naval Postgraduate School, 2011.

Fahy, Michael J. "Understanding 'Swift Trust' to Improve Interagency Collaboration in New York City." Master's thesis, Naval Postgraduate School, 2012.

Federal Emergency Management Agency. *Incident Command System*. Washington, DC: U.S. Department of Homeland Security, 2008.

Fields-Spack, Ryan. "Takin out the Trash." October 15, 2014. https://medium.com/homeland-security/takin-out-the-trash-12e3b5e6b4dc

Gawande, Atul. *The Checklist Manifesto: How to Get Things Right*. New York: Metropolitan Books, 2010. Kindle edition.

George, Fred. "How to Construct a Culture of Airmanship Excellence." *Business & Commercial Aviation* 94, no. 1 (2004): 60–64.

George, Fred. "Qantas Flight 32." *Business & Commercial Aviation* 109, no. 2 (2013): 46–48.

Gordon, Suzanne. Patrick Mendenhall, and Bonnie Blair O'Connor, *Beyond the Checklist What Else Health Care Can Learn from Aviation Teamwork and Safety*. Ithaca, NY: ILR Press: 2013. Kindle edition.

Grote, G., M. Kolbe, E. Zala-Mezˆ, N. Bienefeld-Seall, B., Kunzle. "Adaptive Coordination and Heedfulness Make Better Cockpit Crews." *Ergonomics* 53, no. 2 (2010): 211–228.

Jensen, Jessica, and William L. Waugh. "The United States' Experience with the Incident Command System: What We Think We Know and What We Need to Know More About." *Journal of Contingencies and Crisis Management* 22, no. 1 (2014): 5–17.

Kastros, Anthony. "Mastering Fireground Command: 10 Commandments of Command." Fire *Engineering Magazine*, August 2011, 1–28.

Kluger, Jeffrey. "Fear of Flying: Don't Be Fooled by the Scary News—Air Travel Is as Safe as Ever." *Time Magazine*, July 24, 2014.

Mata, Vinicio R. "The Contribution of Police and Fire Consolidation to the Homeland Security Mission." Master's thesis, Naval Postgraduate School, 2010.

McGeary, Joseph P. "Applying Goldwater-Nichols Reforms to Foster Interagency Cooperation between Public Safety Agencies in New York City." Master's thesis, Naval Postgraduate School, 2007

Meilinger, Phillip S. "When the Fortress Went Down the 1935 Crash of Boeing's Sleek, Four-Engine Bomber Set Back Airpower for Years." *Air Force Magazine* 87 (2004): 78–82.

Ouellette, Judith A, and Wendy Wood. "Habit and Intention in Everyday Life: The Multiple Processes by Which Past Behavior Predicts Future Behavior." *Psychological Bulletin* 124, no. 1 (1998): 54.

National Commission on Terrorist Attacks upon the United States. *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States*. New York: W. W. Norton, 2004.

Nergård Vegard, Ove E. Hatlevik, Monica Martinussen, Arne Lervåg. "An Airman's Personal Attitude: Pilots' Point of View." *Aviation* 15, no. 4 (2011): 101–111.

Neyfakh, Leon. "Plenty of Firefighters, but Where Are the Fires?" *Boston Globe*, September 8, 2013.

Peterson, John, and Schweit, Katherine W. *A Study of Active Shooter Incidents in the United States between 2000 and 2013*. Washington, DC: U.S. Federal Bureau of Investigation and Texas State University Blair, 2013.

Pfeifer, Joseph W. *Crisis Leadership: The Art of Adapting to Extreme Events*. Cambridge, MA: Harvard Kennedy School Program on Crisis Leadership, 2013. http://www.hks.harvard.edu/content/download/67377/1242318/version/1/file/Pfeifer+Crisis+Leadership--March+20+2013.pdf

Phoenix Fire Department. "Phoenix Regional Standard Operating Procedures: Operations at Violent Incidents." In *Protocol MP 206.01*. Phoenix, AZ: City of Phoenix, AZ.

Prabhakar, Hari. "Translation of Aviation Safety Principles to Patient Safety in Surgery." In *Patient Safety in Surgery*, edited by Philip F. Stahel, and Cyril Mauffrey (217–234). New York: Springer, 2014.

Roberts, Gregory A. and Karlene H. Bigley. "The Incident Command System: High-Reliability Organizing for Complex and Volatile Task Environments." *Academy of Management Journal* 44, no. 6 (2001): 1281–1299.

Schamel, John. "How the Pilot's Checklist Came About." Flight Service History. 2012. http://www.atchistory.org/History/checklst.htm

Sullenberger, Chesley, and Jeffrey Zaslow. *Highest Duty: My Search for What Really Matters*. New York: William Morrow, 2009.

Richard H. Thaler, and Cass Sunstein. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven, CT: Yale University Press, 2008.

TriData System Planning Corporation. *Aurora Century 16 Theater Shooting after Action Report for the City of Aurora, Colorado* [redacted and publically released version]. Arlington, VA: TriData System Planning Corporation, 2014.

U.S. Department of Homeland Security. *Implementing 9/11 Commission Recommendations: Progress Report 2011*. Washington, DC: U.S. Department of Homeland Security, 2011.

White House Office of the Press Secretary. *Homeland Security Presidential Directive/Hspd-5 Management of Domestic Incidents*. White House Office of the Press Secretary. Accessed March 12, 2015. http://www.whitehouse.gov/news/releases/2003/02/20030228-9.html

Zijlstra, Fred R. H., Mary J. Waller, and Sybil I. Phillips. "Setting the Tone: Early Interaction Patterns in Swift-Starting Teams as a Predictor of Effectiveness." *European Journal of Work and Organizational Psychology* 21, no. 5 (2012): 749–777.

# INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California